Products finishing

FRED W. VOGEL, Editor

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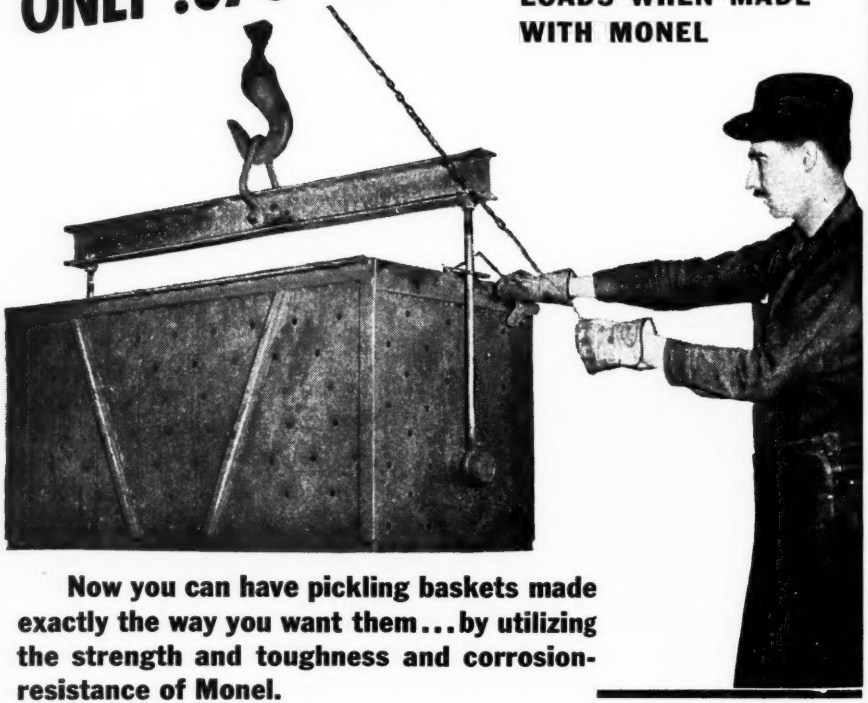

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VOL. 4, NO. 12

THE pleas of industry for skilled men to operate the productive machinery in this country seem to indicate that our present educational facilities are not being used to the fullest extent. In some phases of industrial work the reason may be that the educational programs are sponsored at times when the workmen are busy and unable to attend classes, lectures, and so on. However, in the field of industrial finishing unlimited opportunities are available at all times for the finishing department executive to become a better informed person on the newest development in his field, and thereby a more valuable asset to his company.

Mention of but a few of these opportunities would include the evening schools where laboratory classes are conducted by instructors who give the benefit of long years' experience. Many organizations sponsor regular classes of instruction for the membership. Metal finishing consultants offer their services to aid in the solution of problems in the field and several conduct correspondence courses which have found high regard among outstanding leaders in the field. In many instances equipment manufacturers have set up training schools where the proper technique of finishing material application is offered to the finishing department executive, providing an opportunity for him to study methods and the proper handling of his particular production. And many others.

The finishing department, whether operated as a small job unit or as a closely integrated phase of production, must maintain a high standard of workmanship for the tasks at hand. Let us hope that the metal finishing department executive will not be found wanting.

MURAL PAINTING ON ST

The combination of skillful artis oped painting technique with acce practice points to a more ex tens

By GEORGE HERRICK PHOTO

ABOUT ten years ago, Buell Mullen of Chicago, began experimentally painting on metal. Having studied art prior to her marriage, she continued the instruction in Rome and Belgium. In addition to portraits on the usual canvas, she tried aluminum and other metals. Her first portrait on metal was of the late Mrs. Harold Ickes, done on a sheet of aluminum. Subsequently, she painted others on copper, gold plate, Monel metal, Brittanium metal and high chrome nickel alloy steel.

A view of the mural painted on stainless steel as it appeared upon completion.

About a year ago at the suggestion of Dr. Paul Cret, architect and designer, Buell Mullen was commissioned to execute a portrait of General John Pershing on stainless steel. It was installed in the observation car of a new streamline train of the Burlington Lines called the "General Pershing" built by the Edward G. Budd Mfg. Co., Philadelphia. That was followed by the "Eagle" panels on aluminum for the "Eagle" streamline trains of the Missouri Pacific Lines, built by American Car & Foundry Co.

Because he liked the painting on metal, Dr. Paul Cret as architect of the new Hispanic Room of the Congressional Library in Washington, a presentation of the Hispanic Foundation, recommended a metal mural at the end of the main hall to complete the

ON STAINLESS STEEL

artistry and a newly developed accepted metal finishing tensive use of stainless steel.

PHOTOS BY DISRAELI

wall giving into the arc of the barrel-vaulted ceiling. So, Buell Mullen was commissioned to do the mural and the Allegheny-Ludlum Steel Co. became the donor. So far as is known, it is the first and largest painting of stainless steel or any other metal that has been done. Measuring 12 ft. high by 18 ft. wide and in the form of a lunette, it bears the coat-of-arms of Columbus, granted him by Ferdinand and Isabella of Spain. It is an ornate, rococco, Spanish decoration of the period shown by the room, painted in intense Spanish coloring with architectural motifs predominating.

Painting on metal has been known for centuries, but a glance at standard books of art instruction indicates that use and knowledge of art on metal has been extremely limited. The "old masters" occasionally painted on gold and used a great deal of gold leaf on wood panels or canvas.

Fig. 1 — Paper template is first attached to half of one of the three sections in the mural and the design cut through into surface by small dots and scratches. Artist is here working on transfer of final portion of design. At left may be seen the transferred design brought out with charcoal and partly ground with the electric hand drill.

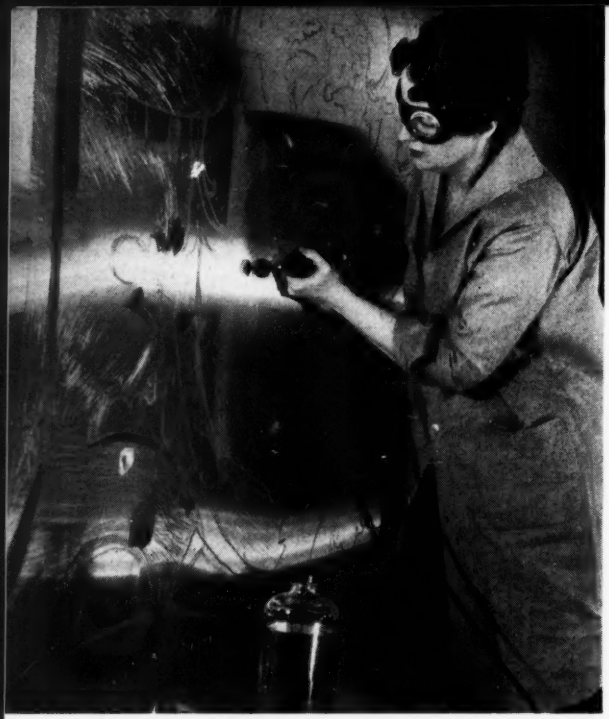

Fig. 2—Using an electric hand drill to break and rough the hard polished surface of the chrome nickel alloy steel so it will hold the paint. Goggles protect the artist's eyes from small fragments of steel. Reflections of light from polished surface presented a slight hazard difficult to overcome in this case because of location of lights.

Dutch painters at one time used some sheet copper in limited size such as the measurement of etching plates. But this was apparently done less by choice than by necessity, as the copper could be secured at less cost than good canvas. The metal was purely a base for these Dutch artists and in using copper they completely covered the surface with pigment in preparatory coats and background.

Through lack of a "school" of painting on metal, much of Mrs. Mullen's work has been pioneering. There have been a few other artists who experimented with metal, principally working with preparation of aluminum sheets. Mrs. Mullen has worked on a wide variety of metals and has had cooperation from steel and other metal manufacturing executives, and is constantly in touch with their laboratories.

The mural now completed and in place in the Hispanic Room of the Congressional Library, offered its principal problems in size and weight. Not infrequently, the mural artist working with customary materials, retains artists to render various parts of his design so that there is plenty of aid. Because painting on metal has been so seldom used by artists and the technique is new, it was decided that Mrs. Mullen would do the entire work herself.

The steel, in three sections of No. 14 gage stainless steel, fitted together to form a huge lunette. It had to be specially rolled by the Allegheny-Ludlum company on a wide mill taking up to 72 in. width. After that, it was polished, cut to shape, profiled at the bottom to fit over an entablature in the wall. On the back of each section, steel angles were welded on to provide support and smaller angles were also welded on with slots through which bolts were drawn to pull the three sections together. This method of bolting together instead of welding was decided upon to avoid the ripple that would have developed from expansion and contraction of such a large area.

Set up, the mural weighs in excess of 1200 lbs. Each section, crated separately weighed 500 to 520 lbs. as

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BULLETIN NO. 51

Here is a bulletin of Finish Baking and Drying Ovens that will be interesting to every *general manager, production manager* and *paint department superintendent* in the industry. Bulletin No. 51 should be in every executive's file. It profusely illustrates installations and diagrams operating features. If you plan on purchasing a new oven, or to obtain more efficiency from old equipment, write on your letterhead for this Bulletin immediately. It will be sent to you by return mail.

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shipped from the mill to the Waldorf-Astoria Hotel in New York, and when completed and shipped from the hotel to the library in Washington. Transportation was a problem at certain points. The hotel found sections were too large to handle in an elevator and each of the three cases had to be carried up stairways by hand. A hotel suite with sufficiently high ceiling was set aside. Because of the profiling on the bottom for the entablature, the mural could not rest on its lower edge and a wooden scaffolding had to be erected to which it was temporarily bolted during the painting. These were special conditions that might not occur necessarily if the mural were set up in its permanent location and painted there.

In applying paint to metal, the primary purpose is to take advantage of the tones in the natural steel or non-ferrous metal, leaving the glow of the surface as a background, which has fluidity and gives a third-dimensional quality as well as great vitality to the painting. Paint does not adhere to a polished surface. So, it was necessary for the artist to incise or "rough" the part of a sheet on which paint was to be applied. In the case of aluminum or copper a tool can be used that will cut the surface very easily. Because of the hardness of chrome nickel alloy steel a "Skilsaw" electric hand-drill with carborundum wheel was used to scar and incise the portions to be painted. This was followed by a diamond point hand reamer. First step is to transfer the design from a paper template. This is attached to the polished surface of the steel with Scotch tape. The design is drawn in and lightly perforated into the surface with a small hand punch.

With design transferred, the drill is used to grind the surface where paint is to be applied. This requires a steady hand and extreme accuracy to avoid running over the edge of the design and spoiling parts that are to remain polished.

Fig. 3—Painting in the quarters of the shield in the coat-of-arms proper. These having been thoroughly roughed, are coated with solid color pigment for a background of the heraldic figures. Below may be seen left-hand quarter of shield partly covered with paint and with scratched surface exposed.

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Fig. 4—Painting in the heraldic emblems in the shield quarters is comparatively easy, as it is pigment on a pigment background. But ribbons and acanthus leaves appearing at left are painted directly on the metallic surface. Stainless steel as background may be seen from reflections in the photograph.

Obviously, re-polishing is practically impossible once such a painting is completed.

The entire mural could have been prepared in this way before beginning actual painting. But the size was such that Mrs. Mullen worked in sections in the beginning, grinding and undercutting only the part to be painted immediately. This was partly because it was heavy work for a 118-lb. woman and largely because the grinding sound vibrated through the wooden scaffolding through the walls of the hotel traveling many stories up and down. As far as possible the incising had to be limited to a few minutes in the middle of the day when few guests were likely to be disturbed.

On a portrait of ordinary size, the preparation of the surface has to precede the actual painting. In that case, the subject poses at a first sitting and the artist makes a careful study in charcoal with primary attention to outline directly on the metal. Following this, the entire surface inside the outline of the figure is cut, or in the case of stainless steel is roughed out by the electric drill and then cut. At subsequent sittings, the figure is painted in, leaving the polished metal as a background. When the final painting is given its permanent finish, the transparent coating is applied only to the painted portion.

On the mural, the decorative design and coat-of-arms of Columbus occupy about 80 per cent of the surface area, with small portions of polished steel gleaming through to show the brilliance of the alloy. "Curiously enough," says Mrs. Mullen, "it is consistent with Spanish art, as they developed the Toledo steel and the Moorish craftsmen employed steel as well as iron in their armor."

In such painting on metal, the best pigments are used, but many different kinds of paints and vehicles have been tried. In her experiments, Mrs. Mullen has kept records of the different mixtures, their durability and af-

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fect on the pigments after application. Final finishing varies with the metal used. Mrs. Mullen points out that the mural just completed might have been done some years ago, except that it has been necessary to make absolutely certain of the chemical reactions of different mixtures of pigments and the metals to which they are applied. Otherwise, durability and permanence of the work might be impaired.

The importance of durability is particularly worth stressing. It is the search for greater permanence that has led artists to experiment with metal to replace canvas. Canvas has considerable durability but certainly is far from permanent. Even the "old masters" after a few centuries are preserved from the ravages of time with great difficulty. Canvas is not opaque and permits the filtration of light rays through the pigments which has a deteriorating effect in many cases. Metal, through which light cannot penetrate, offers the permanency long sought for in the past when artists sometimes used wood panels under stretched canvas to try to prevent passage of light.

Stainless steel with its corrosion resistance is a most desirable medium, although it is not handled as easily as aluminum, copper, or gold. Another advantage claimed by the artist working on metal is the reflectivity. Architects and decorators find that paintings on metal fit in especially well with modern furnishings and decorations as metal is representative of our era from a functional viewpoint. A painting on such a polished surface that, instead of being hung is set in flush with a wall and has its own edge illumination gives an ultra-modern touch consistent with modern materials and interiors.

Buell Mullen, who has developed a great deal in the technique of painting on metals, has also worked in cooperation with makers of stainless steel in efforts to secure various tones that would provide effective backgrounds. In time, alloys will be developed, she believes, that offer the characteristics required without sacrificing the important factors but providing different coloring through processing, an avenue opening up now. It promises to bring further use of metal for both small paintings and large murals.

I. P. C. Handbook. A maintenance painting handbook containing 128 pages of solutions to difficult industrial painting problems is now ready for distribution by the Industrial Paint Clinic, 43 E. Ohio St., Chicago, Ill. This handbook, the first comprehensive guide of its kind in the paint industry, represents the accumulation of reports and records of technical paint questions extending over a period of 27 years. The findings in more than 100,000 actual cases have been compiled to give the results of first hand experience with paint problems that frequently baffle maintenance paint men.

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The manual also contains tables which will assist in estimating the quantity of paint needed to cover various regular and irregular surfaces, a factor that is of extreme importance to the paint purchaser.

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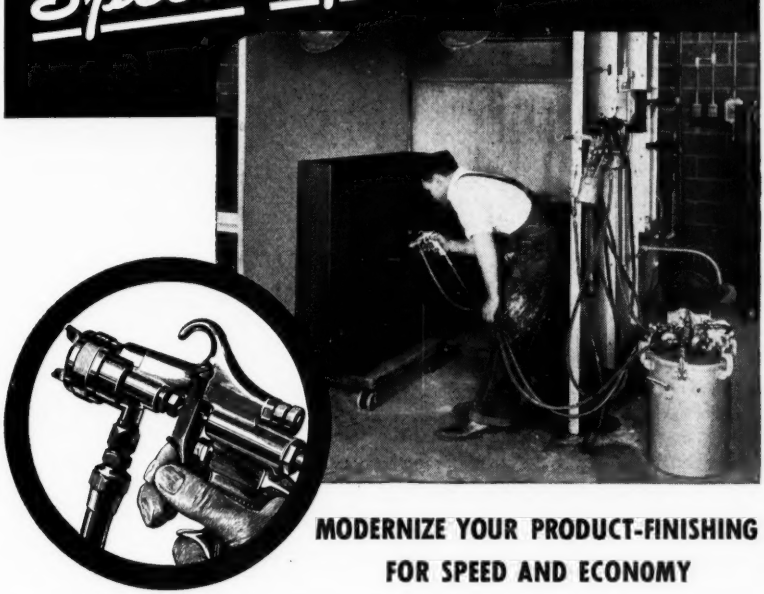

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BARREL FINISHING OF

A Discussion of Barrel Liners and Interior Barrel Design

By H. LEROY BEAVER
Lansdale, Pennsylvania

FROM time to time during the publication of this series we have been asked what if anything had ever been accomplished in the way of interior barrel design or design of barrel liners that would carry away from the conventional perfectly flat barrel interiors.

To satisfy these requests we have gathered from our research files eight separate conceptions of what were at various times claimed to be either barrel arrangements or barrel liners, each of which in itself was proposed to change the entire tenor of barrel finishing operations, and to revolutionize the entire understanding and impression of the practice of finishing metal parts in barrels. There are of course many more than eight of these theoretical arrangements, but we have selected those that showed the widest variation from the generally accepted practice.

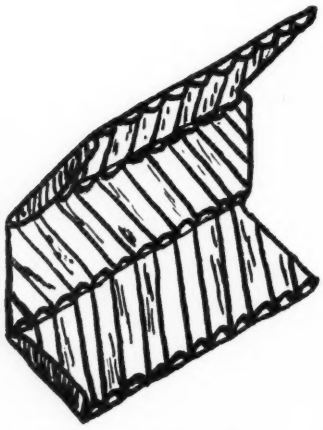

Fig. 1—Illustration showing the construction of a very early barrel lining.

Prior to 1914 Everett and Harvey Barton in Providence, R. I., first developed a barrel for the finishing of small jewelry parts. This barrel was conceived from observing the operation of a laundry wash wheel, or as originally was quite appropriately called a "tubbing machine," and is so known in many quarters by this name even today. Barrels in tubbing machines of this type have smooth sides and are either of six or eight sided construction. It was our good fortune to have been able to examine the very first barrel of this type, and we were surprised to notice that on

OF METAL PRODUCTS

ILLUSTRATED BY THE AUTHOR

the inner surfaces of the barrel, ¾ in. half round strips had been nailed to the liner, each panel being staggered with the preceding panel. When we inquired the purpose of this arrangement, we were told that the wash wheel liner was so constructed, and consequently it was felt that with a liner of this type there would be a better chance for a very active stirring up of the work. This liner is illustrated herewith as Figure 1.

Following this, we find another conception of an improvement in barrel liners wherein the panels are alternately thin and thick, that is, in alternating panels one panel will be heavy at one end of the barrel and thin at the other, but the graduations were not sufficient in degree to cause any appreciable difference in the operation of the barrel from that of the conventional straight sided barrel. This conception is here also shown as Figure 2.

Next we find another conception of a barrel liner rather revolutionary in design and conception in that while the liner for the barrel periphery was smooth, the end liners were made up in segments somewhat resembling the conventional cut of a piece of pie. The theory was that in a barrel of this type that the end plates operating contrary to each other would not only exert far more pressure to parts in process but would also be instrumental in "stirring up the mass of work" thus securing a better action on every part of the surface. One of our more prominent barrel manufacturers, in order to determine whether there was any merit to the claims made for this type of lining, built a number of these barrels. The base of each segment of the liner was made of wood block which in turn was covered with a sheet copper shell. Of all of this type of barrel liner with which we came into personal contact, not a single one substantiated the claims made for it.

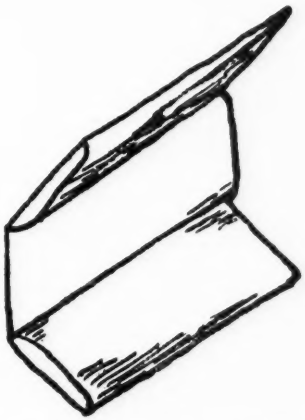

Fig. 2—Drawing showing a barrel lining constructed with tapered alternate panels.

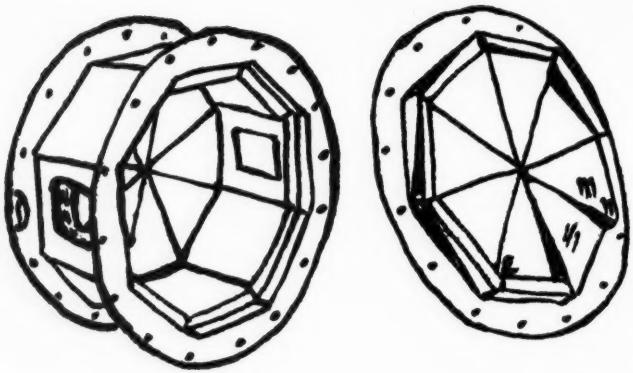

Fig. 3 — Drawing showing the body of a barrel and also the end plate arrangement.

Furthermore, the results were just about diametrically opposite to the claims, and for this reason the device was very quickly abandoned. In this, like the preceding types, the theory was that due to the end plate arrangement, a stirring up effect was obtained that was the all important thing in barrel finishing procedure. This barrel is illustrated as Figure 3, showing the body of the barrel shell itself and the end plate arrangement.

The next conception of an interior arrangement for a burnishing barrel was that, by inserting a cone to either end of the barrel and having the point of the cone project into the interior of the barrel, an arrangement would be attained that would not be unlike a conventional hour glass on its side. This one dates back to 1912. The conception for it was formed in England following an application for a patent on formed steel burnishing materials made by one Wenger (not however the same Wenger who was responsible for the development of The Tahara Silver Burnishing Machine) and one of which was a conical shaped piece with rounded point, formed by being turned from wire on automatic screw machines. The conception apparently was that, if a conical form of burnishing material would be effective, then the same idea carried into the construction of a barrel would be equally effective when operated with the same steel cones. Here again we have the expressed thought that an arrangement of this kind would tend greatly to "agitate the mass of work in the barrel," with which we quite agree. Like so many others of these weird ideas, this one came to nothing, and it is difficult for us to understand at this time how such an in-

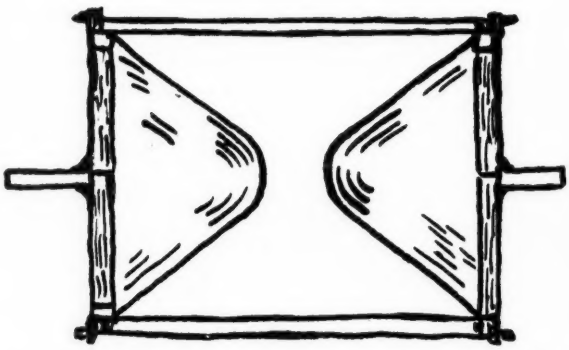

Fig. 4—Drawing of a barrel interior showing a cone-like construction.

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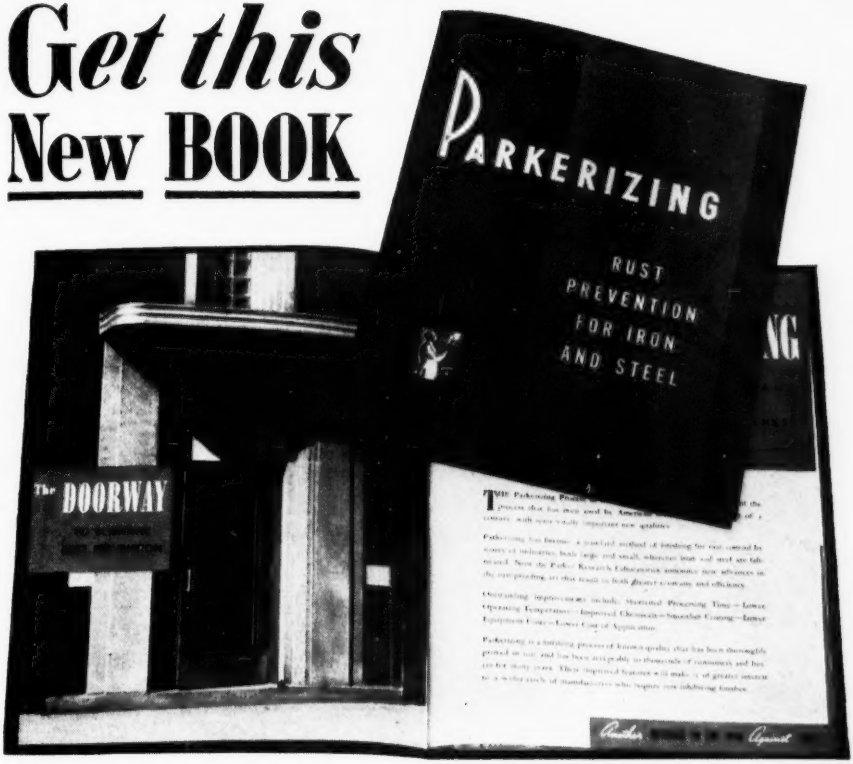

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terior arrangement could ever be effective in any sense. This conception is illustrated herewith as Figure 4.

Our next conception was an attempt to improve on the straight

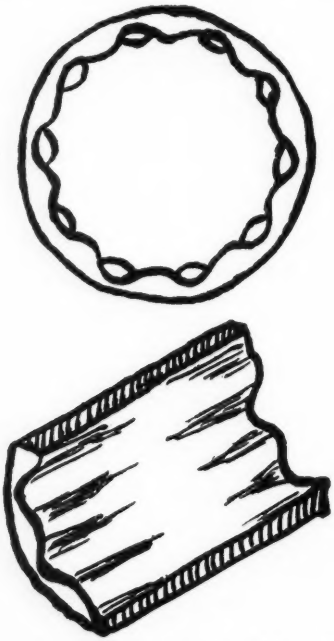

Fig. 5—An illustration of a barrel lining having alternating corrugations which slope towards each end.

side liners employed in barrels of the long and narrow or Baird Type. It will be noted on reference to the illustration Fig. 5 that the interior arrangement was what might be termed a reversed fluted design. The suggestion has been made depending upon whether the barrel were to be used for cutting down work, that is, a plain cast iron barrel that the design could be so cast from metal, and if for burnishing with steel burnishing materials and soap solution, that the conception could be made from wood as a liner and so inserted in the barrel. Perhaps we could do no better than to quote the claims made for this peculiar conception by the one who conceived it, as follows:

> "The design shows alternating corrugations sloping both ways, these corrugations with serated ends make it practically impossible to move the barrel without moving all the contents in different directions. This is real efficiency, and positive"

and once again demonstrates nothing more than another studied effort to create a condition of "stirring up" of the entire mass. This conception is shown as Figure 5.

The next conception was apparently an effort to improve on the interior of what we have termed the high and narrow or Abbott Type of barrel and here we have another illustration of a fluted or corrugated interior design. This one seems to have followed, at least in some respects, the design of end plate shown in Figure 3, in that the liner was built up from triangular sections and these were supposed to operate in some form of opposition to the corrugated or fluted periphery of the barrel. Here again we have the moving thought that in any barrel operation it is essential to create as much agitation within the mass as possible and like practically all of the foregoing, the phrase "stirring up of the mass" is used. This conception is herewith illustrated as Figure 6.

The foregoing illustrations cover Tubbing Machines, Long and Narrow Baird Type and High and Narrow Abbott Type of barrels, and we come now to what are known as the Oblique Tilting Tumbler Type. Figure 7 is apparently an effort to apply a tapered peripheral section to an eight-sided oblique barrel. The illustration in itself will illustrate the thought

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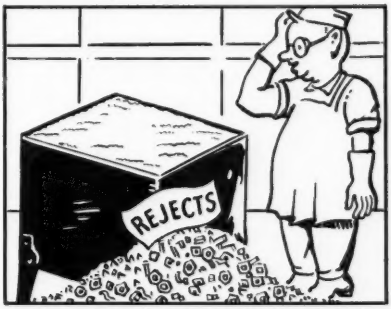

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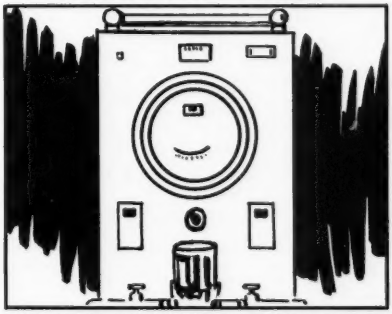

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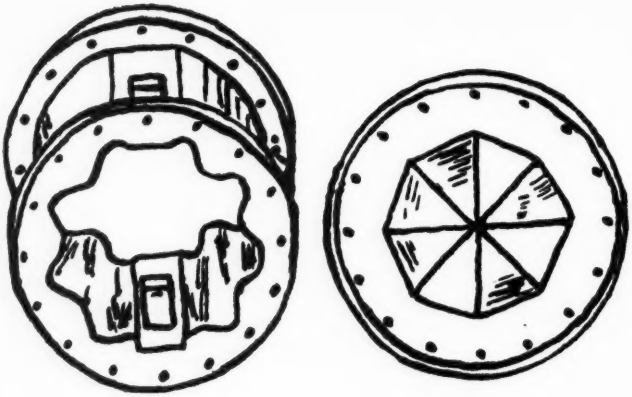

Fig. 6—The end liner of this barrel is built up from triangular sections and is designed to operate in some form of opposition to the corrugated or fluted periphery.

which was in the mind of its originator. It is here illustrated as Figure 7.

As another variation from the flat panel conventional interior design for Oblique Tilting Type Barrels, we have the one illustrated herewith as Figure 8. We have seen only one of this particular design of barrel. To look at it facing the opening, one could not escape the conclusion that it was an attempt to duplicate in a barrel the design of the teeth in a circular saw, this one, too, having a triangular section bottom. We asked the operator of this barrel whether he had found the design more efficient in any way than that of the present conventional type of barrel and his answer was that quite to the contarary he found it far less efficient, and that when operated in the customary way, that is, in a counter clockwise direction as you faced the barrel, it was simply impossible, but that by reversing the direction of the drive and making the barrel operate in the wrong direction they were able to use it, or as he put it "to make it do." Here again as on all of the other conceptions, as illustrated, we have the moving thought of an active stirring up of the entire mass operated in the barrel. This design is here shown as Figure 8.

In addition to the designs, as shown, there are of course many more, their antecedents being washing machines, concrete mixers, peanut roasters and what not, and to continue the illustrations would only be to more aptly illustrate the erroneous conception of the barrel finishing process existing at the respective time and indeed in some cases carried down to the present.

One could not help but observe

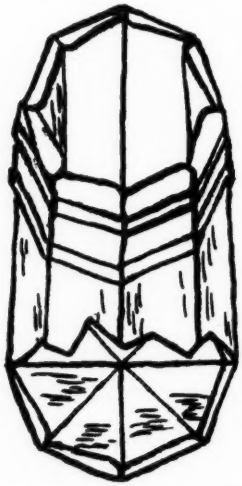

Fig. 7—This drawing shows an apparent effort to apply a tapered peripheral section to an eight-sided oblique barrel.

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that, in all of these cases the one moving thought was to create just as much agitation in the interior of

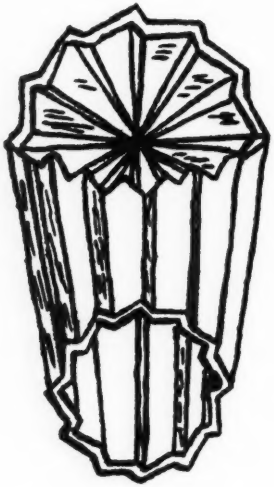

Fig. 8—The lining of this barrel appears to be an attempt to duplicate the design of the teeth in a circular saw.

the barrel when in operation as possible. All of these barrels were scheduled for rather higher operating speeds than are our present day barrels, and it is quite obvious that the only kind of finish that could be obtained in any of them would be by the action of impingement, the least desirable, as distinguished from finishes obtained in conventional barrels by continuous pressure on the parts as they travel through the flowing burnishing mass, which in no case, save that of foundry rattlers should ever come to the point where it could be designated as a "tumbling" motion. Violent agitation never has and never will produce the most satisfactory results.

We could well go back to the translation from the French from the original Rosselieur of George B. Hogaboom to discover the earliest form of smooth sided cylinder operated by a hand crank much after the style of an old fashioned peanut roaster, then to the insertion of longitudinal ribs in such smooth sided barrels to provide some lift for the mass, and then follow this to its later and present development of either six, eight or twelve-sided barrels. Broadly speaking we would say that any instrumentality inserted within the body of a barrel or any design that impeded the even and regular flow of the burnishing mass, is detrimental to obtaining the most satisfactory barrel finishing results. Such instrumentalities do not tend in any sense to provide greater pressure within the mass to provide for faster finishing, and effects secured by complicated interior barrel layout should not be confused with the attainment of greater pressures from the use of the interlocking factors of formed burnishing materials constituting the most highly developed burnishing mass.

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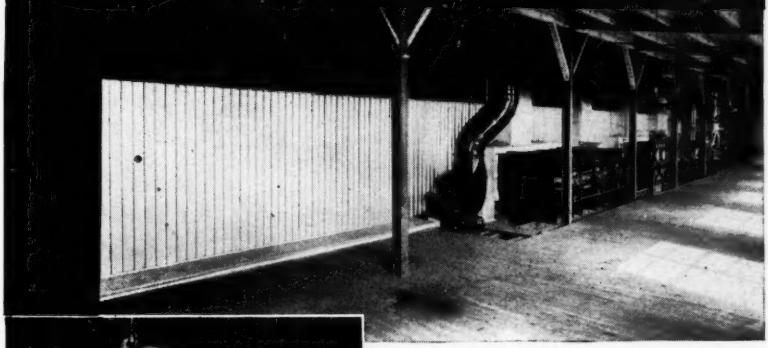

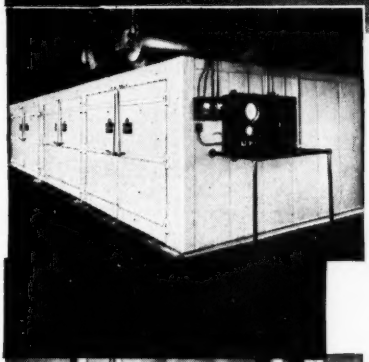

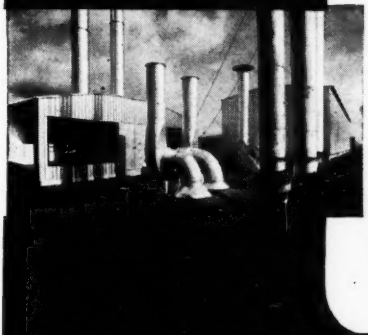

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MODERN GOLD PL

By Joseph B. Kushner, Ch.E.

Metal Finishing Consultant

ON March 25, 1840, the brothers Elkington of Birmingham, England, received the first patent ever granted on the electrodeposition of gold from a cyanide solution. Since that day, few changes of fundamental nature have been made in the art of gold plating. There have been refinements it is true, and slight modifications in the nature of the plating baths used, but the essentials are still the same.

In recent times, gold plating has found many applications, some of which would have astonished those astute Birmingham brothers could they have seen them, but the greatest user of gold plating still remains,

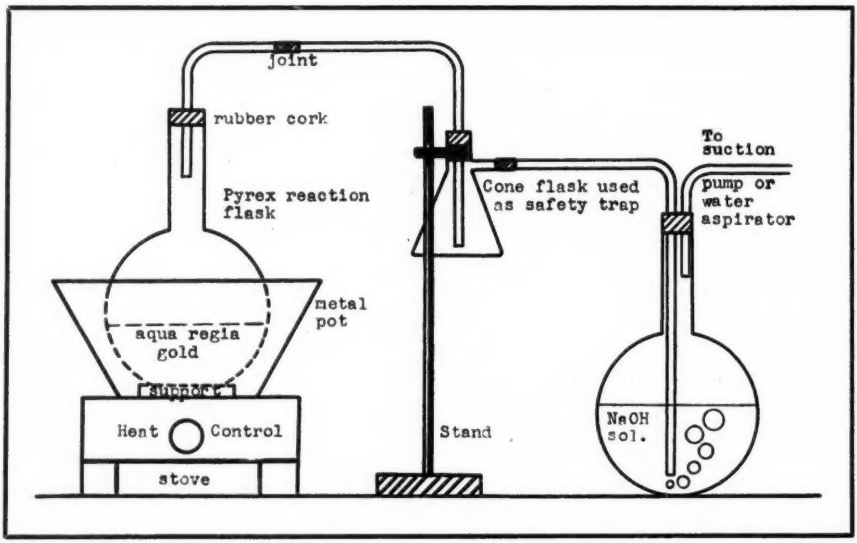


Fig. 1—The dissolving of gold should be performed under a good draft hood or with a fume absorption train set-up as illustrated in this drawing.

D PLATING-PART 1

then as now, the jewelry industry. The "junk" jewelry or costume jewelry line, as it is more respectfully known, an industry that has mushroomed to gargantuan proportions in the last ten years, is probably the greatest user of electrogilding. In this one application alone, thousands and thousands of dollars worth of the precious yellow metal are consumed annually. In spite of the fact that the price of gold has almost been doubled since 1933, gold plating has continued on, undiminished, even though the plating prophets predicted its falling into disuse, and in fact, there is more gold plating work done today than ever before. The ability of gold to provide dense, protective coatings of extreme thinness plus its beauty of finish and "oomph," has kept electrogilding in the forefront of the plating field.

In this article Mr. Kushner presents in interesting manner all types of gold plating including immersion gilding, single cell plating, electrogilding from still tanks, conveyor tanks and barrels.

The tendency today in gold plating, is for the use of prepared gold salts in making up gold plating solutions. In most plating plants, the old time gilder no longer brings down the curses of fellow employees on his head by generating noxious nitric oxide fumes in the process of dissolving gold chemically. Instead, he uses prepared gold salts just as he uses prepared compounds for his other, less valuable plating baths and thus avoids all muss and bother and saves a great deal of time in the bargain. But trend or no trend we will always have with us those platers who feel a gold plating bath isn't just right unless they dissolve the gold themselves and for this reason the methods for dissolving it will be described further on.

Commercial Gold Salts

Gold can be purchased ready for use in the plating bath in either a dry crystalline or powder form or in liquid form. Those compounds of gold that are available for use by the plater are listed in Table I.

The percentages of gold listed in the table are correct only for the pure salts. Those gold salts offered for sale for plating purposes generally contain additional inert compounds which reduce the percentage of contained gold. Thus, a common brand of potassium gold cyanide contains 41 per cent gold and the same brand of sodium gold cyanide contains 46 per cent gold. Furthermore, these salts are not white but yellow as they have been dyed to give a rich yellow color when put into solution.

In the liquid form, gold is generally sold as potassium gold cyanide dissolved in distilled water containing a definite amount of free cyanide and possibly other ingredients. One such liquid gold, formulated by the writer, that is now meeting with considerable commercial success is sold by the gram weight of metallic gold con-

tained in the prepared solution. There are also, several completely prepared gold salts to which the purchaser has merely to add water and use, but these, whether in liquid or dry form do not give the content of gold and the label on the container generally reads "enough to make 1 gal. of gold plating solution." This type of salt is intended for use by small jewelers and amateur platers who are not interested so much in knowing how much gold they are getting for their money but in how many rings or teaspoons it will plate.

The use of both the avoirdupois and the troy system in the selling of gold salts by weight, has always been a source of confusion. The use of both systems is neither efficient nor time saving and very often leads to mistakes which can assume serious proportions. A peculiar feature which comes to light is the fact that some suppliers when selling gold do not mark the weight of contained salt as, for example, "1 ounce avoirdupois" or "1 ounce troy" but merely mark the bottle "1 ounce." It may be a troy ounce or it may be an avoirdupois ounce but the plater does not know it unless he asks or finds out for himself. Very often, a plater figuring out the price he is paying for gold salts comes to the conclusion that he is paying very little above the price of pure gold when he buys his gold in salt form but a little investigation soon shows that the man is under the impression he is buying his gold by the troy ounce when he is really getting it on the avoirdupois basis. For this reason, some simple arithmetic is in order.

Table I

Name	Formula	Description	Per Cent Gold Content
Gold chloride (acid)	$HAuCl_4.3H_2O$	orange yellow crystals	48.5%
Gold hydroxide	$Au(OH)_3$	brown powder	79.5%
Gold oxide	Au_2O_3	brownish black powder	89.5%
Gold tricyanide	$Au(CN)_3.3H_2O$	white crystals	60.0%
Gold potassium cyanide	$KAu(CN)_2.2H_2O$	white crystals	60.5%
Gold sodium cyanide	$NaAu(CN)_2$	white crystals	72.5%

A Table of Common Gold Salts

Weight Conversion

1 troy ounce=31.10 grams=1.097 avoirdupois ounce.

1 avoirdupois ounce=28.35 grams=.911 troy ounce.

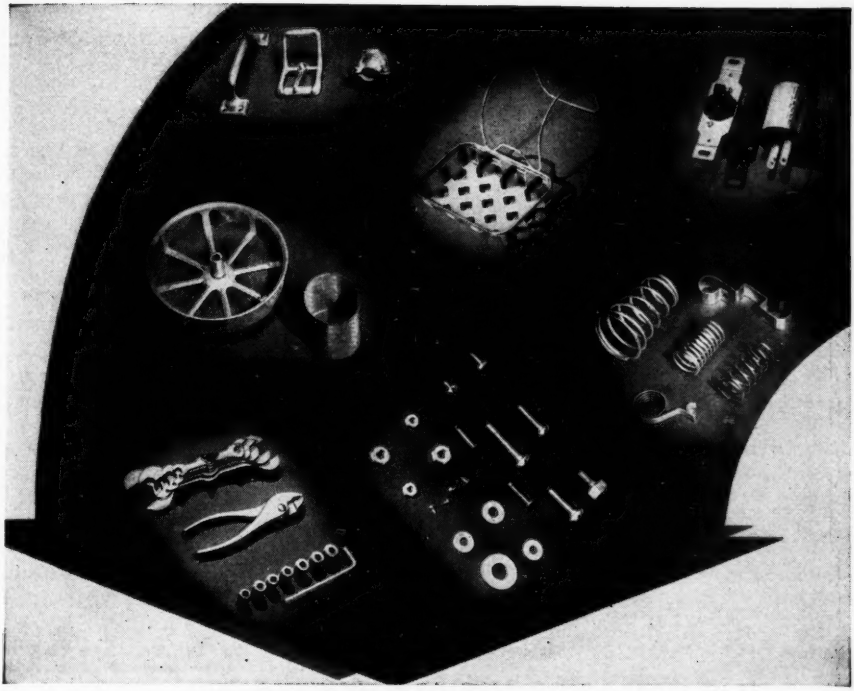
Example

A troy ounce of gold is worth $35.00 at the present government price. If a plater purchases an ounce of commercial potassium gold cyanide containing 41 per cent pure gold for $15.45 the current market price, he gets, depending on whether it is a troy ounce or an avoirdupois ounce:

Troy ounce—35 x .41=$14.35 worth of gold.

Avoirdupois ounce—35 x .41 x .911 =$13.10 worth of gold.

For those platers and chemists who desire to "roll their own" as far as gold plating is concerned, there are



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two available satisfactory methods for getting metallic gold into solutions: the chemical method and the electrochemical method.

Dissolving Gold Chemically

Gold, chemically speaking, is a pretty tough customer. It will not dissolve in ordinary acids but it does readily dissolve in aqua regia, a mixture of nitric and hydrochloric acids. During the reaction poisonous brown nitric oxide fumes are copiously evolved, as is indicated by the equation of the reaction:

$$Au + HN0_3 + 4HC1 = N0 + HauC1_4 + 2H_20$$

For this reason, the dissolving of gold should be performed under a good draft hood or else with a fume absorption train as illustrated in Fig. 1.

Procedure

Take the gold (999.75 fine), which should be in ribbon form, and cut it into small pieces with a clean pair of shears. Place the shreds into the reaction bottle (round bottom is best) rest the bottom of the bottle safely inside of a metal pan or a heavy porcelain evaporating dish so that if the bottle breaks by accident the gold will not be lost.

Make up a mixture of about 200 cc. of hydrochloric acid (Specific gravity 1.46) with 245 cc. of water. To this carefully add 45 cc. of nitric acid (Specific Gravity 1.4). For every ounce of gold to be dissolved add about 125 cc. of this mixture to the reaction flask. If the absorption train is being used, turn on the suction and place the cork in the mouth of the flask at once. If the reaction takes place under a hood nothing further need be done. Permit the reaction to take place without heat at first as it will be quite vigorous, then as it starts to slow down turn on the heat,

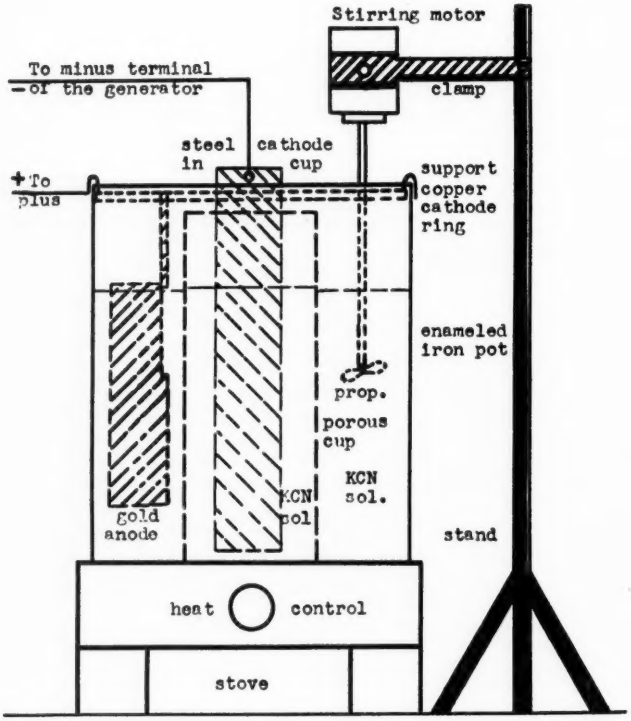

Fig. 2—Drawing illustrating a set-up for dissolving gold for plating purposes by the electrolytic method.

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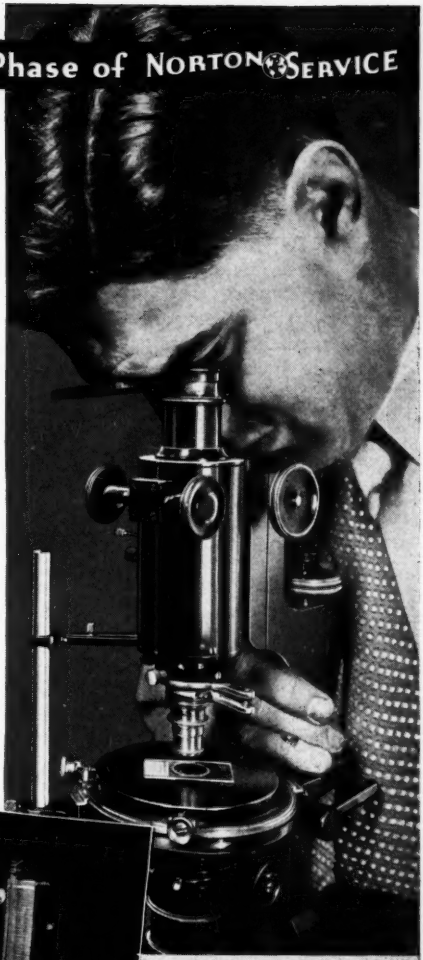

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and increase it gradually, until the mixture is boiling. Heat until all the brown fumes have disappeared and continue boiling the mixture to small volume with occasional additions of hydrochloric acid to completely drive out the nitrates present.

Cool the contents of the flask and dilute with 3-5 volumes of water. Pour the contents of the flask into a large glass beaker or stone crock, carefully rinsing out the flask with a few additional volumes of water. With constant, slow stirring, add concentrated ammonium hydroxide. If most of the nitrates have been driven off, a light yellow brown precipitate of gold fulminate will form at once. Add just enough ammonia to make the solution barely alkaline, as indicated by a strip of litmus paper. An excess of ammonia must be avoided as the fulminate is somewhat soluble in the excess. This is a step many platers slip up on and as a result they lose valuable gold down the sink. Let the precipitate settle, then syphon off the topmost layers of liquid. If no Büchner funnel is available, add pure water to the precipitate, stir around and permit it to settle. Syphon off the water again and repeat this washing operation several times to make sure the nitrates and chlorides have been removed. The washing operation is extremely important as the precipitate has a tendency to occlude impurities. These impurities may often be the cause of spotting, staining and other gold plating ills. For those who wish to make sure the chlorides have been completely removed by washing, a drop of the final wash water can be tested with silver nitrate solution. If a cloud forms, chlorides are still present in the precipitate.

The fulminate of gold should be kept under a layer of water if the plater desires to have it stand in the precipitated form over a period of time, as it is very explosive in nature. Gold fulminate is a complex chemical compound whose structure is still a moot point. It has the empirical formula $AuN_2H_3.3H_20$. The nitrogen is held to the gold by a thread, figuratively speaking and when dry, the slightest shock will cause the compound to explode with the liberation of nitrogen, water and gold. However, when it is wet it is perfectly harmless.

To bring the fulminate into solution, add to the washed precipitate sufficient potassium cyanide dissolved in a small volume of water and stir. The solution can now be made up to a given convenient volume and can be used as a gold stock solution. Since the gold has been weighed before dissolving and the losses, if this method has been followed, can be assumed to be negligible, a stock solution is obtained, each cc. of which contains a definite weight of gold. This is a great convenience for when gold additions must be made to a plating tank it is not necessary to make a weighing; a simple volumetric measurement in a glass graduate, takes its place. Thus for example, if 2 ounces of gold have been dissolved in 20 fluid ounces of water then every fluid ounce of solution contains .1 ounce of gold.

The Electrolytic Method

Probably the best method for dissolving gold for plating purposes, is the electrolytic method. With this method there is no danger of getting contaminating substances such as chlorides and nitrates into the solution and so the tedious steps of the washing operation are completely eliminated. Though no nitric oxide fumes are given off during the process the odors evolved are unpleasant

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and fairly toxic, therefore the setup should be placed in a spot where the ventilation is good or else under a hood.

Procedure

Purchase the pure gold (999.75 fine) in ribbon form about 1 to 3 inches wide. Make a thin cut along the edge, bend up this very thin strip and use it as a mounting wire. Mount

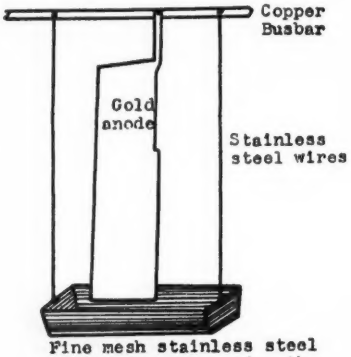
Copper Busbar
Gold anode
Stainless steel wires
Fine mesh stainless steel basket directly under the gold anode catches debris

Fig. 3—Fragments of gold from the disintegrating anode fall into a stainless steel basket such as the one shown in this illustration and thus permits further dissolution by the current.

the strips as shown in the diagram Figure 2. Fill the enameled iron pot with a potassium cyanide solution containing about 100 grams per liter of KCN. Now fill a suitably sized porous pot with some of the same cyanide solution so that the level of the solution inside and outside the pot is the same. Put several iron or steel cathodes inside the porous pot and connect the generator with the positive side to the gold strips and the negative side to the iron cathodes. The temperature of the solution should be about 60 deg. C and some form of agitation should be used, preferably a motor stirrer. The current density permissible is quite high if the solution is adequately stirred. The writer has used densities as high as 300 amperes per square foot in certain cases. With such high current densities a considerable amount of gold can be dissolved in a very short space of time. Thus as approximately a quarter of a troy ounce of gold can be dissolved by one ampere flowing for an hour (an ampere-hour) a current density of 40 amperes means that 10 troy ounces of gold will be dissolved in an hour. These figures are an approximation of course in view of the fact that the current efficiency is not 100 per cent. It is in the neighborhood of 85 per cent. Too high a current density must be avoided, since the gold will become completely polarized and none will dissolve at all. For those who dissolve gold this way frequently, it will pay to connect an ampere-hour meter into the circuit so that the approximate amount of gold that has been dissolved after a given time will be known. Otherwise, the gold anodes must be removed from time to time and weighed to check on the amount of metal dissolved.

After a short time, the gold anodes will become quite thin and minute fragments of gold may fall off them. All these fragments can be saved and dissolved by making use of a stainless steel basket hung as illustrated in Figure 3 to catch the gold debris and permit its further dissolution by the current. If the precaution has been taken to use pure cyanides in making up the dissolving solutions, negligible amounts of chlorides will be present and the steel will not be attacked.

After a given amount of gold has been dissolved in this manner, remove and thoroughly wash the gold anodes into the enamel tank; remove and thoroughly wash the outside of

the porous pot likewise, and pour the contents of the porous cup into a storage bottle for further use. If the porous cup is of good quality, only negligible amounts of gold will be present in this solution, if any are present at all, and this solution can be used and reused several times before it must be discarded or added to other gold washings to be sent to the refiners. Now filter the solution containing the dissolved gold through a good quality paper with a cone or Büchner funnel, into a suitable bottle. Wash the paper a few times with hot water and save it for any very fine gold particles it may contain. Make up the solution to a convenient standard volume and it is now ready to be used as a gold plating stock solution.

The next part of this paper will deal with immersion gilding and single cell gold plating.

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To the Executive.

To the Purchasing Agent.

To the Polishing Room Superintendent.

Gentlemen:

It may be you don't even know what we are talking about because you have never used AIRWAY VENTILATED BUFFS, but that's no excuse. If you buy AIRWAY VENTILATED BUFFS then you will know what we are talking about when we say we will save you 50% on your cotton buff wheel costs.

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President.

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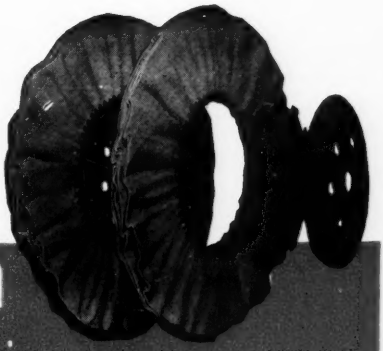
Warning Notice

Jackson Buff Corporation of Long Island City, New York, has rights to U. S. Patents Nos. Re 19,894 and 2,140,208 which have broad claims covering an air-cooled buff having means for the admission of air through the sides of the buff.

Owner intends to protect all rights and stop infringement.



CORPORATION

LONG ISLAND CITY, N.Y.

SPEEDING UP FURNITURE PRODUCTION

By W. V. Morrow

IN the high competitive furniture industry, manufacturers are forced to utilize every economy provided by modern science in order to offer their products at a price attractive to the buyer and profitable to themselves. Profits in the furniture industry during the last decade have been won only by the greatest ingenuity in reducing processing costs, particularly in shortening the time required to turn out orders without sacrificing quality. Quality in furniture, through modern factory methods, has steadily improved since machines took most of the burden off the workmen and automatic controls superseded human judgment wherever possible.

Profits per unit have steadily narrowed over the years, while manufacturing processes have improved the quality of the merchandise sold with the result that the average family can acquire today furniture of a sort that only kings and nobles could have had a few hundred years ago. Nearly every year some plant in the industry carries on experiments to improve manufacturing efficiency as a means of bettering its competitive position.

A typical instance of such an undertaking is provided by the Hard Manufacturing Company, of Buffalo, N. Y. This 50-year-old furniture manufacturing firm originally produced beds and now puts out a complete line of fine ward furniture for hospitals — beds, springs, dressers, chairs, mattresses, tables, and miscellane-

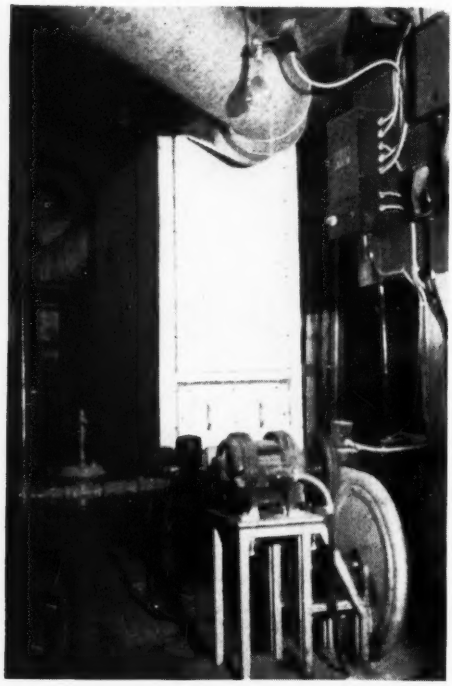


Fig. 1—Heat is supplied by unit on the floor directly beneath the oven; the control board is at left, and the combustion chamber approximately in center.

Fig. 2—Two circulating ducts convey the heat through oven.

ous pieces. They set out to find a means of shortening their processing time and step up their output. The company originally made furniture entirely of wood, but for many years has specialized in steel furniture. The original equipment in the paint shop was designed for drying wood furniture but had been modernized some years ago to handle steel. Steam had been used as the drying agent.

After considerable investigation of costs and time saving, the company decided to install gas heating equipment. A Despatch oven with the new Despatch gas-fired indirect air heater and accessories were purchased and installed last summer.

The oven is heated by the indirect method which was selected to assure that only clean air would get into the oven where the furniture is being baked, thus eliminating the risk of having the finishes marred. Certain colors and pastel shades are affected adversely insofar as their durability, luster, and tint are concerned if any agency other than clean air comes in contact with them during the baking process. The oven installed by the Hard Manufacturing Company, through a highly efficient circulating system heats and reheats clean air. From one-fourth to one-third of the air is purposely permitted to escape during the circulating movement to permit the disposal of any foreign matter in the paint.

The manufacturing problem can be summed up as follows:

Under the steam method of baking the furniture after enameling or painting, the units were put in one of three kilns having a total area of 1300 sq. ft. This required the services of a fireman every day the kilns were in operation. The pieces were put in the kiln at night and allowed to bake for five hours. Whether the volume of work was sufficient to require the use of one kiln or three, the fireman had to be on the job, and of course his services cost money, while approximately the same amount of coal was required whether one or three kilns were used. An average of three days was required to turn out a given batch of furniture with three coats of finish, as only one bake per day was possible.

With the use of the gas oven, manufacturing was speeded up, achieving a saving in time estimated at approximately one-half that of steam operation. The gas oven requires only 25 minutes to heat up to 300 deg. F., which is this plant's temperature requirement. Every piece of furniture that goes into the oven remains for one hour at this temperature. All finishing materials are bought according to specification to stand 300 deg. F. oven temperature.

"By using gas heat," said C. M. Howard, factory manager of the Hard Manufacturing Company, "we

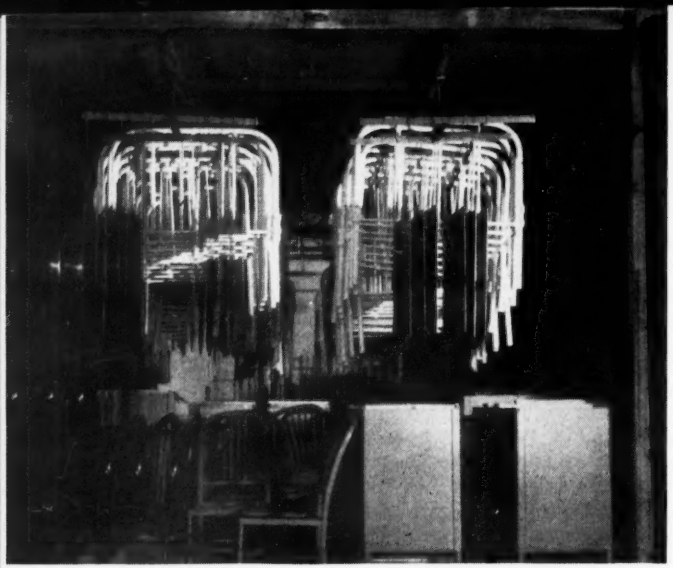


Fig. 3—Here is how oven appears when it is charged with furniture ready for finishing. In this load were 10 dressers, 30 beds, 15 chairs and 6 cabinets.

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are able to operate six bakes a day where formerly we had only one. Under the old system, we used 1300 sq. ft. of kiln for baking purposes; with the gas oven, we require only 200 sq. ft. The greater turnover gives us six bakes a day, an equivalent of that attained under the old system with the important difference that we can bake the same piece or series of pieces three times in one day whereas formerly three separate days would have been required. Under the most favorable conditions, the old system required 3½ days to turn out an order. Today, with the gas-operated oven, we can fill the order in a day and a half, and can save 16½ per cent in fuel costs.

"In these days, when distributors handle smaller stocks of goods than ever before, and depend largely on the manufacturer to make prompt shipments after receiving an order, speed is very essential and that was our main objective in installing the gas oven. The saving in dollars represented by the comparative costs of coal and gas in the old kiln and our present gas oven, respectively, is not so important as saving a day and a half in filling an order. This represents actual dollar savings which cannot be allocated to the last cent but includes such factors as the satisfaction of customers in our service and the fact that we now have only one day's production in process of manufacturing at a time. Formerly we had to have three or four days' work under way simultaneously, as the slower steam kiln drying acted as the bottleneck of the process, slowing down productive speed. The prompt baking in the gas oven reduces transportation costs within the factory.

"There are other advantages in using gas for baking purposes. The controls are automatic and the heat is uniform as well as clean."

The Hard Manufacturing Company was organized in 1895 at Oneida, N. Y., and operated in that town for the first year of its existence. The following year it moved to Buffalo, first locating on Pearl Street, but since 1901 it has occupied its present plant which it built. The company has been virtually under the control of the same family since it started. J. H. Dyett is chairman of the board, and his son-in-law, John B. Caldwell, is president. The company exhibits its products in the important furni-

ture expositions of the industry in Chicago and New York and has national distribution.

(This article reprinted by special permission of "Industrial Gas.")

Fluorescent Lamp Guide. A practical guide to the application of Mazda F lamps and equipment, designated as "Fluorescent Lighting," is now being published by the Westinghouse Lamp Division, Westinghouse Electric & Manufacturing Company, Bloomfield, N. J.

The 23-page booklet explains how the lamps work and the whys and wherefores of auxiliaries. Answers are given for the many questions every lamp and lighting man is asked today about d-c operation, temperature effect in outdoor operation, color, stroboscopic effect, radio interference, and lighting costs.

Illustrations of installations, wiring diagrams, and tables of essential technical data are used throughout the book. Current-limiting devices, starters, lampholders, and other auxiliary apparatus are discussed in detail.

The new book tells briefly where, why, and how Mazda F lamps should be applied to achieve the better lighting that these new sources make possible.

Copies of the booklet may be obtained from the nearest district sales office of the Westinghouse Lamp Division.

Precision Scientific Bulletin 315. Precision Scientific Company, 1750 N. Springfield Ave., Chicago, Ill., announces publication of Bulletin 315—24 pages, illustrated, containing detailed specifications and performance data on a wide range of thermostatically controlled, electrically heated constant temperature laboratory equipment. Comprehensive information is included on cabinets utilizing gravity and mechanical convection heat transfer, in several distinct types, suitable for research, routine testing or processing, in connection with a wide range of materials used in the mechanical and process industries. Applications discussed are accelerated aging of materials; baking of finishes; dehydrations to determine moisture content; disintegration tests; and preheating of materials such as plastics. Particular emphasis is laid upon the laboratory treatment of asphalts, paper, pulp, and rubber. Copy free upon request.

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"RACKS STILL IN SERVICE AFTER 8 MONTHS"

SAYS THIS USER OF

UNICHROME* RACK COATING-W

Still they come—the enthusiastic reports from manufacturers and job platers alike, after using "Unichrome" Rack Coating*. For example, one user writes:

"The rack we had coated eight months ago is still in service in our Chromium Plating cycle. Your Rack Coating-W has been completely satisfactory."

The reason these "Unichrome" Rack Coating-W users find this rack coating material so outstanding is its unequalled combination of advantages:

(1) Withstands boiling cleaners and all plating solutions.

(2) Tough—withstands wear and tear of handling.

(3) Contains no ingredients harmful to plating solutions.

(4) Cuts costs—reduces frequency of recoatings.

(5) Easy to apply—"dip and force dry" method.

(6) Light in color—easy to see how well the rack is covered.

(7) Any part of rack can be recoated without recoating entire rack.

Write for Bulletin No. 31
Containing Complete Information

Platers without rack coating facilities may have their racks coated with "Unichrome" Rack Coating-W* by Chromium Corporation of America, 4645 West Chicago Avenue, Chicago, Ill.; Belke Manufacturing Company, 947 North Cicero Avenue, Chicago, Ill., or Lea Manufacturing Co., of Waterbury, Connecticut.

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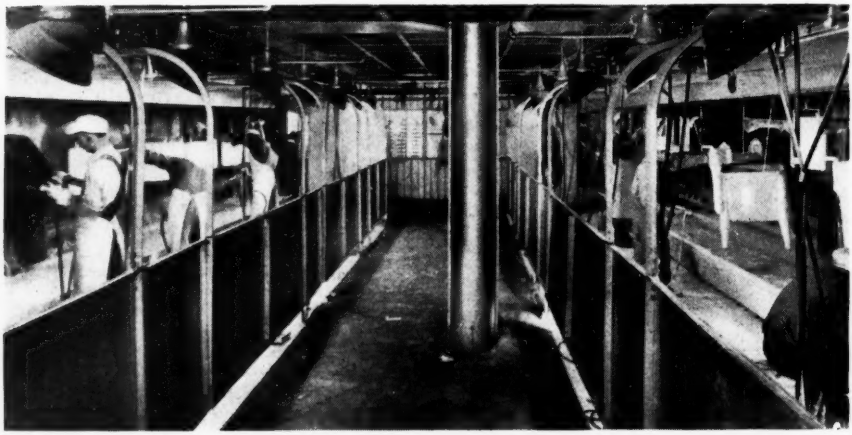
WASHING MACHINES FINISHED IN MODERN PLANT

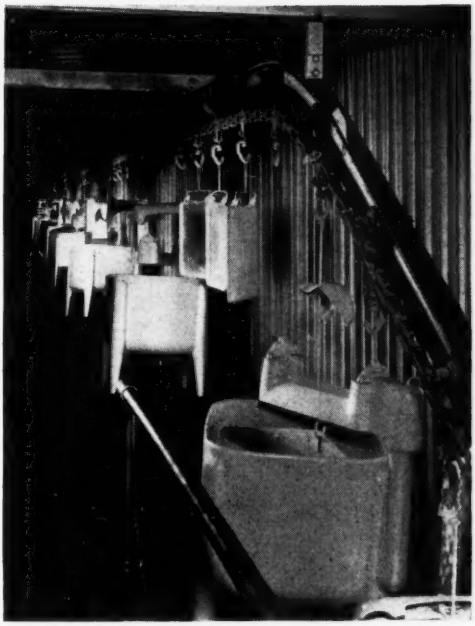
By Bartlett West

AN installation of finishing equipment in the Maytag Washing Machine Plant, Newton, Iowa, is unique in that the entire system, with the exception of the spray room, is located and housed on the roof of the building. It is of particular interest to manufacturers because this arrangement permits great saving in valuable floor space within the manufacturing plant, and in this case, the entire installation was made without interfering with manufacturing operations. From the accompanying layout each application of the finishing process and the travel of products on the continuous conveyor system can be traced. Each operation has been perfectly coordinated and the entire system engineered to meet the exacting requirements of the manufacturer.

Parts are carried by conveyor from the storage trucks on the fourth floor up through the roof into the steel housing which encloses all the equipment located on the roof. The parts pass through an alkali wash, two rinse stages, a rustproofing machine and



First and second coats are applied in Mahon Hydro-Filter spray booths located in a completely enclosed, air conditioned spray room.



Washing machine parts passing through the cooling zone after leaving the final coat baking oven. At this point the parts go down through the roof to the unloading point on the fourth floor.

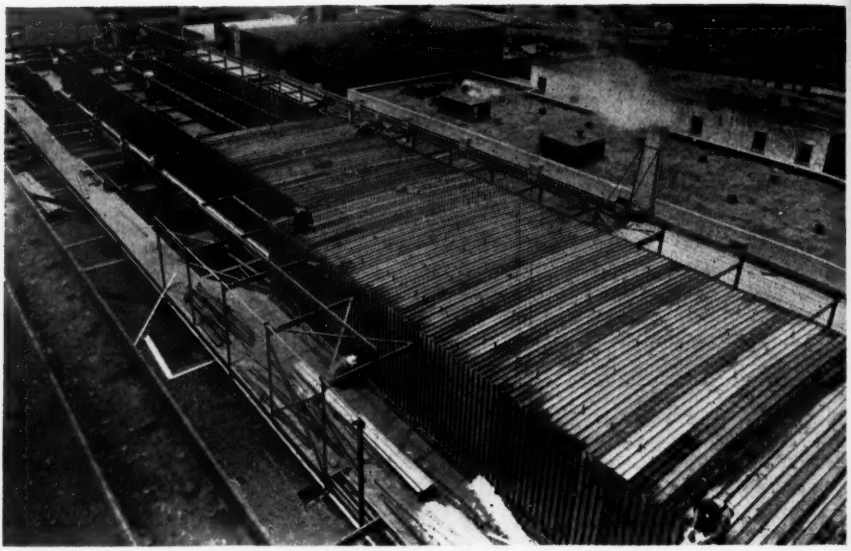
●

two more rinse stages. They then pass through a dry-off oven and down through the roof to the spray room and into the prime coat spray booth. From the prime coat spray booth parts pass up through the roof again and into the prime coat baking oven from which they are carried by the continuous conveyor back into the factory and to the assembly lines. Rustproofing, painting and baking individual parts in this manner before assembly insures paint coverage on certain parts of the machine which would be inaccessible were they painted only after assembly. After the assembly lines the assembled portions of the machine are placed on the finish coat conveyor. Just before entering the finish coat spray booth they are wet sanded and thoroughly cleaned.

In the finish coat spray booth the machine receives its final coat of synthetic enamel and thence up through the roof again into the final coat baking oven. After leaving the final coat baking oven the machines pass through a cooling chamber before they go down through the roof again to be distributed to the final assembly and crating lines.

All of the solutions used in cleaning, rustproofing and rinsing equipment are heated by means of steam coils in the supply tanks. These coils are of such capacity that the entire equipment can be brought up to any desired temperature in from 10 to 30 minutes. The temperature of each tank is thermostatically controlled and the temperature of the spray nozzles is adjustable. Each tank is equipped with a pressure gauge, thermometer, and water level device. The dry-off oven is heated by means of circulating hot air. The entire rustproofing machine is of the bottom seal type in which there are only two openings, the entrance to the washing machine and the exit from the dry-off oven.

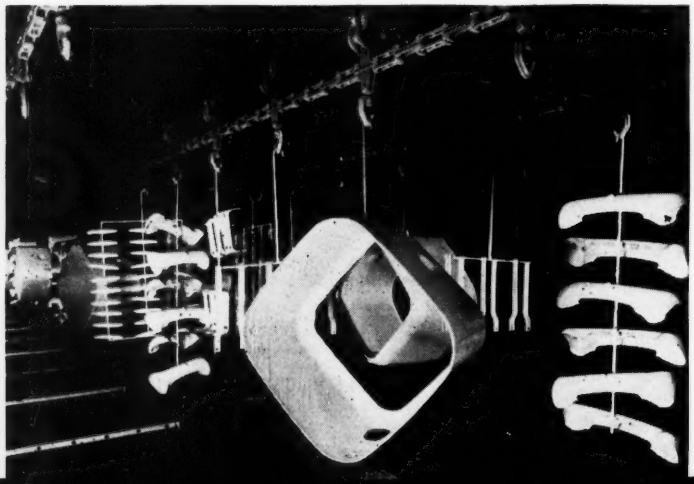
The spray booths are Mahon hydrofilter down draft type with full flooding back panels. The overspray is removed from the air in the centrifugal section of the hydro-filter chambers before it passes out through the exhaust fans. The supply air to the spray rooms is provided by an air heating and washing plant located on the roof. The supply air enters the system through a set of louvers and a thermostatically controlled preheating coil which raises the temperature



The complete finishing system under construction on the roof of the Maytag plant.

to approximately 45 deg. F. At this temperature the air may be safely washed, regardless of outside weather conditions, and the air is then passed through a Mahon air washer and another set of reheating coils also thermostatically controlled. The last set of coils are controlled by the temperature desired in the spray room. Two large double width centrifugal fans then blow the air into a plenum chamber over the spray room. The bottom of the plenum chamber serves as a ceiling for the spray room and this ceiling is completely covered with air filters which is further insurance against any dirt entering the spray room.

The enamel baking ovens are both heated by means of direct fired recirculating heaters in which the products of combustion finally enter the oven after being mixed with the recirculated air.. All fresh air entering the oven, including combustion air, is thoroughly filtered. All openings in the oven are in the bottom to provide heat seals. Prime and finish



Washing machine parts passing through the prime coat baking oven on a continuous conveyor.

SPOTLIGHT ATTENTION—that's what your advertisement in the October issue of PRODUCTS FINISHING will get from metal-finishing executives.

This issue, in addition to its regular articles, will feature the National Metal Show to be held in Cleveland, Ohio, from October 21 to 25. The regular circulation of over 16,000 will include 5,000 souvenir copies, specially Wire-O-Bound, which will be sent to key executives in large production plants.

Souvenir copies will also be distributed from the PRODUCTS FINISHING booth at the show. This handy, pocket-size guide to the show will contain a complete floor plan and list of exhibitors and personnel in attendance.

The October issue will be placed in the mails at least two weeks before the show opens.

This is the time to get YOUR sales message across to metal-finishing executives—while equipment and supply increases are the order of the day.

Send in your space reservation now.

CLEANING

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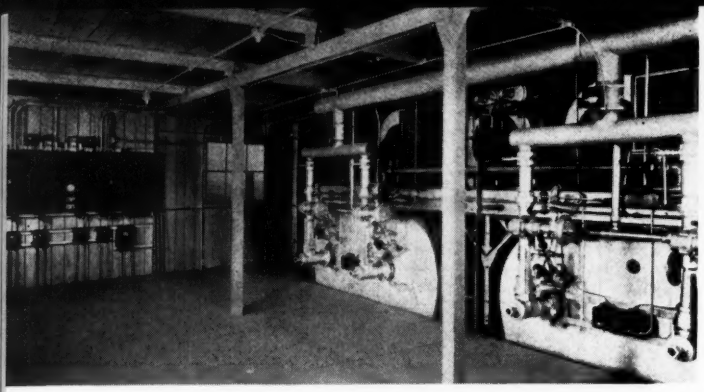

Oven heating equipment and safety and temperature control panels. All of this equipment is housed in an all-steel firesafe enclosure on the roof of the plant.

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coat ovens are entirely separate and may be regulated independently of each other. Each oven is completely equipped with recording controllers and safety devices. The total capacity of the heating system on both ovens is 8,000,000 B.t.u. which is far in excess of the actual load on the ovens but is provided for extreme flexibility. As just one indication of the flexibility available in this layout it may be said that these ovens can be changed from room temperature to 350 deg. F. in approximately ten minutes.

Goodrich Mechanical Rubber Goods Catalog. Containing a vast amount of information in condensed form easily understood by purchasing agents and plant maintenance men, this 24-page catalog is now being issued by The B. F. Goodrich Company, Akron, Ohio. With a graphic illustration of a huge conveyor belt system operating on a coal mine as its front cover, the next two pages of the catalog illustrates and describes typical examples of Goodrich developments in unusual applications of rubber.

Three pages are devoted to a discussion of rubber transmission belting, together with instructions on how to splice the belting endless in the factory, distributor's warehouse, or on the machine. The data includes tables on minimum pulley diameters, transmission belting horsepower, a simple method for correcting horsepower ratings, and a discussion on selecting proper grade and type of belt. Following this section is a section on V-belt drive problems.

One of the most interesting sections of the catalog includes four pages discussing the company's cord conveyor belt, endless splicing in the field, and shock idler mountings, with a complete description of the belt, recommendations on conveyor belt service, a table on conveyor belt data, and a discussion and data on elevator belt problems.

Six pages are devoted to a discussion of the many types of hose and fittings available for practically every type of service, with accompanying data. The remaining five pages cover other lines of products, including packing, rubber mats and matting, hard rubber sheet and pipe, rubber linings and rubber lined tanks, pipes and acid drums, rubber paints, cements, putty and plastic compounds, rubber tape, Vibro-Insulators for reduction of vibration and noise and cushion impacts, rubber expansion joint fillers, and other products.

Copy of the catalog will be sent free upon request.

Standard Specifications of Porcelain Enameling Supplies. The Porcelain Enamel & Mfg. Co., Eastern and Pemco Aves., Baltimore, Md., has just released one of the most useful guides to the enamel industry in recent years. It comprises a complete set of standard specifications for porcelain enamel supplies, and gives such accurate, detailed information to purchasing agents and plant superintendents that its limited edition is already practically exhausted as this goes to press.

In announcing this innovation, H. G. Wolfram, vice president in charge of engineering, said, "These specifications not only prescribe the grades of material which have been found most suitable in producing high-quality porcelain enamel ware, but they furnish as well methods of test whereby it is possible, when necessary, to determine whether

or not materials purchased meet the specifications. The present specifications, where possible, present not only the pertinent physical and chemical requirements and methods of testing, but also outline in brief functions of the product in the enameling operation.

"Another purpose," said Mr. Wolfram, "In developing this set of Standard Specifications was to permit the purchaser of raw materials entering into the manufacture of porcelain enamel products to have a yardstick or measure by which the quality of all raw material might be judged, bearing in mind that the cost of high-quality mill and pickle room chemicals in the finished product is very small, indeed, because of the small quantites used. However, the effect of these chemicals on the quality of the finished product is proportionately very great. For example, a low-quality mill addition may give rise to defects in the finished ware which will, in a single day, destroy any savings which may have been obtained in the purchase of the material in question."

The Standard Specifications include the following porcelain enameling supplies: Ammonium Carbonate, Barium Carbonate, Bentonite, Borax, Calcium Chloride, Clear Clay, Powdered Enameling Clays, Unrefined Clays, Cleaner, Titanium Dioxide, Dyes for Stainless Enamels, Epsom Salt, Feldspar, Flint, Magnesium Carbonate (light), Nepheline Syenite, Enamel Opacifiers, Ceramic Coloring Oxides, Zinc Oxide, Pickling Acid, Potash Alum, Sodium Aluminate, Sodium Nitrite, Ammonium Alum, and Soda Ash.

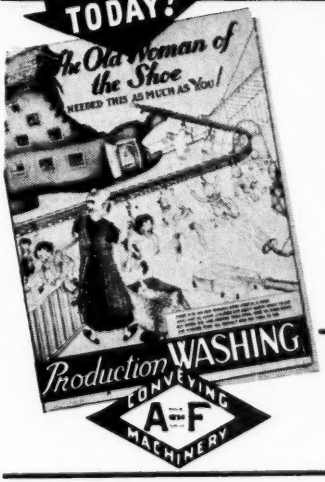
From time to time it is said additional specifications will be issued, and supplementary factual information furnished. The Standard Specifications were prepared by Lyman C. Athy, director of research, and George H. Spencer-Strong, research engineer at the Pemco Laboratories, Baltimore.

Finish Baking and Drying Ovens. A bulletin designated as the No. 51 in which oven installations are illustrated and operating features diagrammed is now being distributed by Despatch Oven Company, Minneapolis, Minnesota.

A copy will be sent free upon request.

FREE! TO "EXECUTIVE" READERS OF "PRODUCTS FINISHING"

SEND FOR THIS BOOKLET TODAY!



• THIS INTERESTING, valuable booklet—"The Answer To Industrial Cleaning Problems"—explains how you can make savings in your product or parts washing operations in 6 different ways.

Naturally, *your* cleaning problems are "different." But this booklet will point the way to cost-cutting methods, designed for your special requirements. There is no obligation in writing for this booklet—or in receiving advice on your product cleaning problems! Write today.

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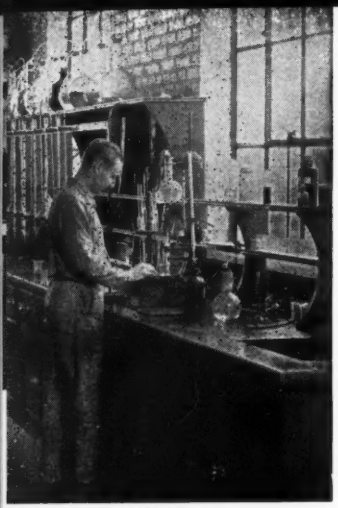


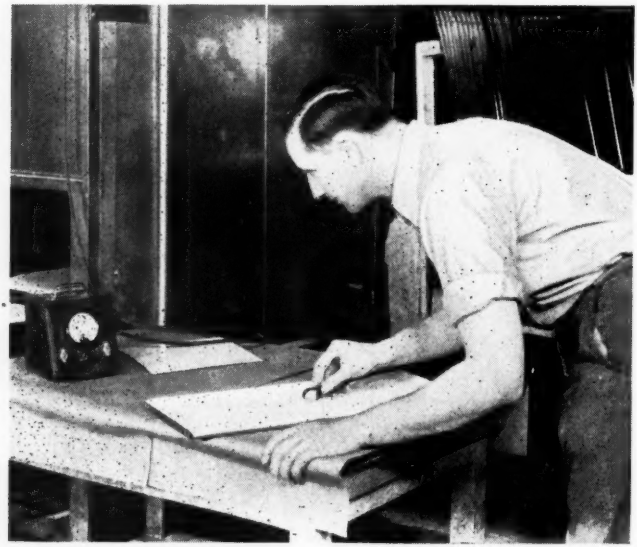
Practical Applications of MODERN Equipment

Electric Gages Save Time and Check Color for Stove Manufacturer

DEFINITE savings in production time have been made by the Florence Stove Company, Kankakee, Ill., through the use of General Electric thickness gages to measure the thickness of the porcelain enamel applied on steel parts of its gas ranges. It is interesting to note that these electric gages are also used to check the color of the enamel being applied. This is possible because the color varies with the thickness.

Former methods entailed weighing the steel parts of the stove before and after they had been coated with enamel, and while the enamel was still wet. However, some sections of a part might receive a heavy coating while other sections received a very light coating.

It was also necessary to keep a



General Electric film thickness gage being used to check porcelain enamel on steel parts for gas ranges

mass of records of each batch of parts going through. The electric gages are direct reading and therefore very easy to use.

New Equipment for Service Departments

A NEW trend toward service department modernization evidenced by the larger and more progressive industrial organizations is forcibly demonstrated by The Hoover Company, North Canton, Ohio.

Time was when the service department of many sales branches was poorly housed, inadequately equipped and generally treated with indifference. The work was done the difficult way and its inferior quality reflected this poorly conceived policy.

But the modern way now prevails in the more progressive organizations. Up-to-date precision tools and methods are being used and the best of skilled workmanship employed for a job more thoroughly and more quickly turned out.

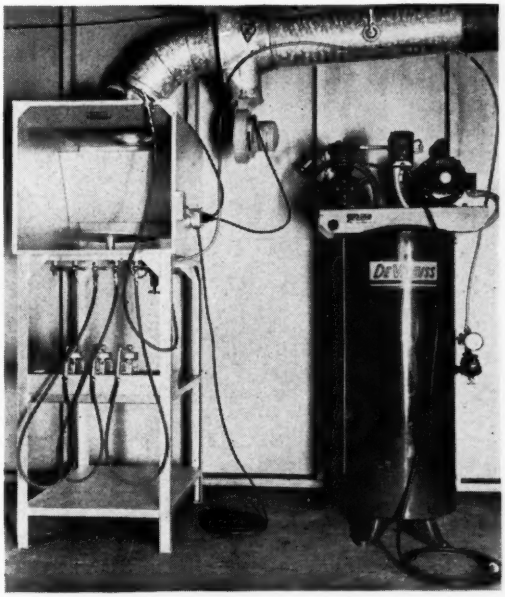
Typical of this new order is the policy adopted by the service department, an important unit of the Sales Division of The Hoover Company, North Canton, Ohio. Each year, this department of each of the many sales branches of this company recondition thousands of Hoover cleaners, restoring them to a condition comparing favorably in performance and appearance with the newly built cleaners.

•

The Hoover Company has recently provided each of its factory branch service stations with the latest type equipment necessary to refinish all enameled parts and clean the motors of the cleaners.

This equipment, including spray gun and dusting gun, air compressor, spray booth and related parts, was procured from The DeVilbiss Company, Toledo, Ohio. It was found best suited to the work of improving the appearance of the users' cleaners brought in for service, was best adapted to restoration of the particular wrinkle finish of the cleaners and capable of a more thorough job of removing dust from the motors and castings.

Service department executives of The Hoover Company say the investment in this extensive installation is relatively small in the light of the return effected through the resulting customer satisfaction. The company



Equipment installed in Hoover factory branch service stations.

has been enabled to not only do a reconditioning job more thoroughly and completely, but much more quickly as well, earning for its service organization a reputation which distinguishes it in the industry.

Seitz Sheet Filters. An up-to-date and comprehensive presentation of sheet filters in all their modern advances is given in the new catalog now being issued by the American Seitz Filter Corporation, 204 21st Ave., Paterson, New Jersey.

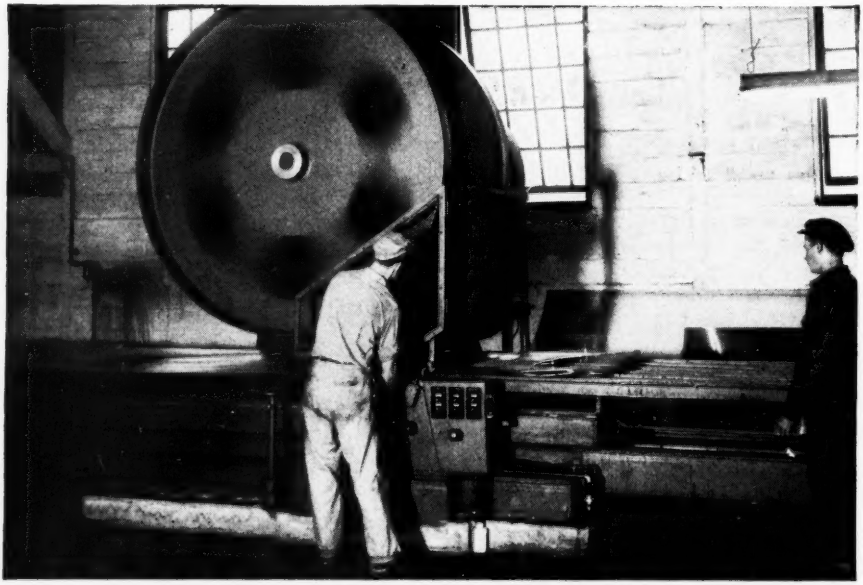
The catalog describes the simplicity and flexibility of the Seitz system, how double filtration and 100 per cent sterilization are obtained, how high yields are secured at low pressures, and the wide range of asbestos sheets available through the patented Seitz process for the requirements of different liquids.

Special attention is given to the clarifying and sterilizing of acids with Seitz acid-proof filters and to the intermediate filters for specialized sterilization work and for medium-volume clarification. Particular emphasis is made of Seitz construction which is rugged and durable.

The catalog points out that the research files of the Seitz Laboratories contain much valuable data on filtration and sterilization, which have been gathered in an experience of over 50 years. This information, as well as the cooperation of Seitz chemists and engineers, is available to users of Seitz filters in helping to solve filtration problems.

A copy of the new Seitz Sheet Filter catalog will be gladly mailed to any reader on request.

Test for Acid Resistance of Porcelain Enamels" Revised. The Product Standards Section of the Porcelain Enamel Institute, 612 N. Michigan Ave., Chicago, Ill., presents this week a revised edition of the bulletin on acid resistance of porcelain enamels. This revision now makes it possible to check the finished porcelain enameled product by means of



The Jessop Steel Co., Washington, Pa., has recently installed the large drum type grinding and polishing machine shown above for finishing sheets and plates up to 50 in. wide by 14 ft. long, of any type metal, especially stainless steels and Silver-Ply stainless-clad steels.

a spot test, where before it was necessary to cut out a sample and completely immerse it in the solution. The bulletin contains three sections—a Commercial Test, an Umpire Test, and a Research Test. The general classifications of acid-resistance, "AA," "A," "B," and so on, remain the same as before.

This test is intended to cover flatware—that is, table tops, sign, refrigerator and stove parts, architectural panels, and similar products. Cooking ware has been excluded, and will be covered in another bulletin.

The importance of the present test lies in the fact that it may now be put to wider use. It is readily adaptable to use by the various testing agencies and laboratories for the establishment of standard requirements for products. It will be valuable to the manufacturer, who may check his products in his own plant. It will serve the buying departments of retail stores, inasmuch as they may easily conduct their own tests, and further, may specify that the articles they purchase are to be of a certain acid resistant quality, classified according to Porcelain Enamel Institute standards.

The present revised edition of the acid resistance test represents more than five years of study and research. The Porcelain Enamel Institute feels that much has been accomplished, and looks forward to continued progress in such research to keep the porcelain enameling industry at the highest possible level of achievement.

Copy free upon request.

A C P Rust-Proofer. A method for obtaining paint protection by means of a liquid chemical treatment designated as A C P Rust-Proofer is described in a folder which is now being issued by American Chemical Paint Company, Dept. 303, Ambler, Pa.

Mention PRODUCTS FINISHING when writing to advertisers. Your cooperation will be appreciated both by the advertiser and this magazine.

METAL CLEANER

The *SOFT RUBBER* binder *CUSHIONS* the abrasive

for Polishing, Pre-Polishing and Pre-finishing metals. Removes burrs, blemishes, rust, tarnish and stain from metals. Erases heat marks from welds on stainless steel.

Made in TABLETS - WHEELS *and* DISCS

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Weldon Roberts Rubber Co. Newark, New Jersey, U. S. A.

News OF THE INDUSTRY

Derick S. Hartshorn, Jr., Becomes Technical Director of The Enthone Company

J. F. Buckman, president of The Enthone Company, New Haven, Conn., has announced the appointment of Derick S. Hartshorn, Jr., as technical director of The Enthone Company. He will supervise development of new products, and also do sales engineering work.

Mr. Hartshorn received his technical training at the University of North Carolina, and for the past seven years has been associated as chemist with Westinghouse Electric & Manufacturing Company, East Springfield, Mass. He is well known in the plating and finishing field for numerous papers which he has presented at national and local meetings. In 1938 he presented a prize winning paper on copper plating at Milwaukee. Mr. Hartshorn is also director of the New England Control Laboratories, and the facilities of these laboratories will be merged with those of The Enthone Company. Mr. Hartshorn is a member of the American Electroplaters' Society, The Electrodepositors Technical Society of England, and the Electrochemical Society.

Cowles Detergent Company to Larger Quarters

The need for more space, caused by expansion, makes it necessary for the Cowles Detergent Company, Cleveland, Ohio, to move to larger offices. On and after August 31, 1940, the executive and general offices of this company will be located at 7016 Euclid Ave., Cleveland. There will be no interruption in business affairs during the change in location. All friends and customers of the company are cordially invited to inspect the new quarters after September 1st.

Paint Companies Merge

Under a plan recently approved by the stockholders of the American Asphalt Paint Co., Chicago, and its subsidiary, The Marietta Paint and Color Co., Marietta, Ohio, the two companies have been consolidated and are now operating as one corporation known as the American-Marietta Company.

Mr. Grover M. Hermann, president of the new company, made the announcement this week at the general offices of the American-Marietta Company, 43 E. Ohio St., Chicago, Ill. Mr. Hermann founded the American Asphalt Paint Co. 27 years ago and under his direction the company has become one of the leading manufacturers of heavy duty industrial maintenance paints under the trade name "Valdura."

The Marietta Paint and Color Co. was founded in 1897, and its president, Mr. George A. LaVallee, continues as a director of the American-Marietta Company.

The plants operated by the company are located at Kankakee, Ill.; Marietta, Ohio; High Point, N. C., and Lincoln, New Jersey.

Combined sales of the two companies

for the seven months period ending June 30th show a gain of 19.1 per cent over the same period last year. This increase has made it necessary to double the capacity of the Kankakee plant during the past year and further expansion of the company's production facilities at Marietta, Ohio, is now under way.

Hall Thermalamp Introduced to Industry

The new Hall Thermalamp, the most modern engineering development in infra-red low temperature electric heating was presented at a special prevue showing held at the C. M. Hall Lamp Company plant, 1035 E. Hancock, Detroit, Mich., July 31st and August 1st.

An inspection tour of the Engineering Research Laboratories of the C. M. Hall Lamp Company was the highlight of the convention program. Test results showed G. E. engineers conclusively that the new Thermalamp reduces by two-thirds the time now required in infra-red baking operations.

Keynote speaker was T. Murray Jones, manager of apparatus sales, General Electric Supply Corporation, Bridgeport, Conn. Other speakers included: Howard Haynes, engineering staff member of General Electric, Nela Park; Henry Bond, western sales manager, Ault & Wiborg; W. F. Anklam, president, Hall Lamp; and Paul Goodell, managing engineer, Radiant Heat Division of Hall Lamp.

General Electric Supply Corporation will act as national distributors of the Thermalamp, manufactured by the C. M. Hall Lamp Company of Detroit, pioneer manufacturer of automobile headlamps. The C. M. Hall Lamp Company has likewise pioneered the latest developments in infra-red heating and are in a position to license users of the equipment under patents of the Ford Motor Company.

Quaker Research Laboratory

According to a recent announcement, the Quaker Chemical Products Corporation, Conshohocken, Pa., has broken ground for a new research laboratory. The construction of the building is to be of brick and concrete throughout.

Plans for this laboratory call for accommodation of 15 researcn chemists and it has been designed purely for research and development work. The old laboratory will continue to be used for control and plant work.

The design of the laboratory includes

Prevue showing group composed of executives and sales representatives of the General Electric Company, General Electric Supply Corporation, C. M. Hall Lamp Company, Detroit, Michigan. The new Hall Thermalamp, latest development in infra-red heating, has just been presented to the G. E. Supply men, who will distribute the product nationally.

division for stock room, sample room, rest room and reading room, with almost 70 per cent glass area around the building for excellent lighting.

Platinum Leaf for Building Decoration

The first application of platinum leaf for building decoration was recently completed on the outer vestibule ceiling of the 67 Wall Street Building, New York City.

Platinum leaf — latest product of the ancient art of gold beating—is beaten down to a thickness which requires a stack of 250,000 leaves to measure an inch in height. Yet, when applied to a surface, the leaf provides a metallic effect with all the rich color and beauty of platinum.

Cross and Cross, architiects, selected the metallic leaf for the entrance because of its brightness, tarnish resistance, and freedom from discoloration by atmospheric conditions.

Platinum leaf has been available for several years for outdoor signs, interior decoration, bookbinding, and a wealth of other decorative uses where its lustrous color is desired.

Its initial use in art was on the statue "Dawn of Tomorrow," sculptured by Mrs. Harry Payne Whitney for the New York World's Fair.

Courses In Electroplating

The Institute of Electrochemistry and Metallurgy, 59-61 E. Fourth St., New York City, will offer specialized courses in the field of electroplating and metallurgy during 1940-41. Registration will be held for the fall term from September 10th to September 17th. Registration will be held for the spring courses from February 6th to February 10th inclusive and the first class will occur on February 7th. The following studies will be offered:

Fall Courses

Electroplating I.

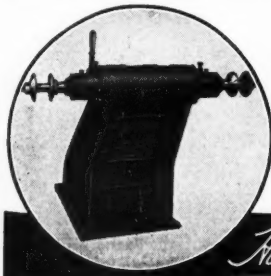
The course is designed to give the electroplater or industrial worker a foundation in chemistry including qualitative and quantitative analysis. One hour each evening will be devoted to class lectures in which will be discussed the theories of modern chemistry as applied to electroplating. The remaining hours will be devoted to the laboratory, where the student will conduct his own experiments. Tuesday and Wednesday, from 7:30 to 1:00 P. M., Dr. Young and Mr. Klinsevich. Fee, $45.00.

Metallurgy I.

The student will be introduced to the structure of metals and alloys and factors are taken into account which affect these, such as temperature, mechanical working, and so on. The application of the phase rule to physical metallurgy will be discussed. Both binary and tertiary systems will be studied and illustrated. Heat treating, surface treating and testing of metals and alloys will be studied. Tuesday and Wednesday, 8:30-9:30 P. M., Dr. Young and Mr. Klinsevich. Fee, $30.00.

Research I.

This course is designed to give the practical electrochemist a chance to investigate problems in his field. One-half hour per week is devoted to a conference with the instructor in which the method of attack is laid out. The remaining time is spent in the laboratory, where the student applies his knowledge and technique to the solving of problems which arise in such an investigation. Tuesday and Wednesday, 7:00-11:00 P. M., Dr. Young. Fee, $30.00.



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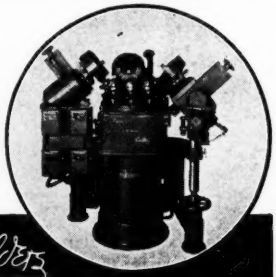
POLISHING MACHINES

POLISHING LATHES ★ . . . Ask for Catalog No. 10.

AUTOMATICS ★ . . . Rotary and Strait-Line. Send samples for prices and approximate production figures.



Hammond Machinery Builders

NEW YORK 1622 Douglas Ave., KALAMAZOO, MICH. CHICAGO

One-Third of a Century of Service to American Industry

The Kirk & Blum Manufacturing Company, Cincinnati, Ohio, is now celebrating its third of a century of business. Starting May 20, 1907, with a modest shop and an ambitious idea, the company has gradually built up and expanded. It now occupies a plant where two acres of floor space is equipped with modern machinery, much of it built for the particular requirements of Kirk & Blum. The organization numbers some two hundred men, including: a research and engineering staff; draftsmen; sheet metal artisans; and field erecting crews.

Kirk & Blum has specialized in the planning, fabrication, and erection of dust control systems, ventilating and cooling systems and, since 1924, industrial drying and baking ovens. All Kirk & Blum installations are built to exact engineering standards and are representative of highest quality at minimum cost.

As industry has adopted new processes and materials, and as new legal requirements imposed by welfare legislation have appeared, Kirk & Blum has kept pace with new developments in its own products. Many of its designs are patented and exclusive.

The company has issued several booklets illustrating its products and installations in various lines of industry. These, available to interested industrial executives on request, are: "Blower Systems for Woodworking Plants"; "Dust Collecting Systems in Metal Industries"; "Fan Systems for Various Industries"; "Cooling Systems for the Glass Industry"; "Industrial Ovens."

A. Oakleigh Bush Appointed to New Position

A. Oakleigh Bush has been appointed assistant chief sales engineer of the Abrasive Division of Norton Company, Worcester, Mass. Mr. Bush has been with Norton company for about 16 years first in the electric furnace plant at Niagara Falls and then in the Research and Sales Engineering departments at Worcester. In 1937 he was transferred to the Norton London office and later to the English plant at Welwyn, becoming its acting general manager in 1939. He returned to Worcester about a month ago with other American members of Norton Company's European staff.

Full of Ideas and Methods you need Now!

This Performance Data book is designed to help you select the cleaning methods and materials that will improve product quality, cut costs and insure smooth, dependable production—results so essential to the metal working industry in connection with the national defense program.

GET YOUR COPY

The book outlines what users of Magnus Metal Working and Cleaning Materials have been able to accomplish in comparison with formerly used materials and methods. Full of ideas that will help you save money, speed production and meet rigid quality specifications.

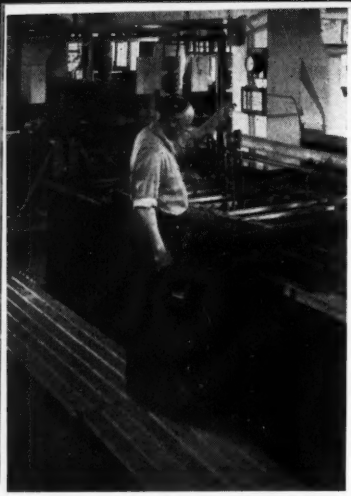
Write for your copy.

MAGNUS CHEMICAL COMPANY

Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants.

208 SOUTH AVENUE **GARWOOD, N. J.**

MAGNUS CLEANERS



New PLANT EQUIPMENT AND Materials

Skilsaw Disc Sanders

Three additions to the Skilsaw Disc Sander line, to be known as the Models SP, H2, and SL, have been announced by Skilsaw, Inc., 5037 Elston Ave., Chicago, Illinois.

Model "SP" is a two-speed heavy duty sander and polisher, specially developed for steady use in metal-fabricating plants where there is need for a variety of sanding, polishing, and buffing operations. When operating at a speed of 4,200 r.p.m. with a seven-inch disc, it is said to provide a maximum of sanding efficiency. When changed to 1,300 r.p.m., the tool is said to be ideal for

Model "H2" Skilsaw Disc Sander

use with felt rubbing pads or lamb's wool polishing bonnets for rubbing down lacquered surfaces and other polishing operations. A simple gear shift makes it very easy to change from one speed to the other. Eight heavy duty ball bearings mounted on all shafts make possible carrying maximum loads and insure quiet operation and long life. Model "SP" is 18½ in. long, weighs 14¾ pounds.

Model "H2" is a two-speed heavy duty sander which is said to provide real economy wherever sanding work is constant in nature. A nine-inch disc is first used at a speed of 2700 r.p.m.; then, when the outer edge of the disc becomes worn, it is re-sized to a seven-inch diameter using a special disc trimmer which is provided with this sander. The smaller disc is then mounted on the alternate seven-inch pad and is used at a speed of 4200 r.p.m. Eight heavy-duty ball bearings mounted on all shafts give this tool efficiency and long life. Model "H2" is 19½ in. long, weighs 16 pounds.

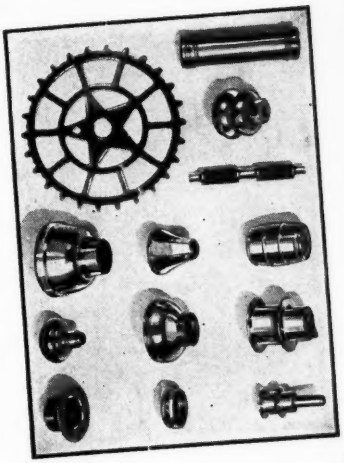
Model "SL" is an extra heavy power unit that can handle a wide variety of heavy duty sanding, grinding, and surfacing operations. It operates at a no-load speed of 5000 r.p.m. which is the speed recommended by grinding wheel manufacturers as the most practical for six-inch wheels to insure fast production and long life. Model "SL" may be used with various sanding pads, grinding wheels, wire cup brushes and other accessories in the Skilsaw line. The tool is 18 in. long and weighs 15 pounds.

Shriver Plating Solution Filter

A plate and frame pressure filter for filtering plating solutions has been placed on the market by T. Shriver & Company, 808 Hamilton St., Harrison, N. J. The design of the filter and the corrosion resistant construction of all parts exposed to contact with the fluid being handled are said to provide versatility of application.

The Shriver plating solution filter is said to be complete, compact, and port-

Packer-Matic
Automatic
POLISHING & BUFFING MACHINES



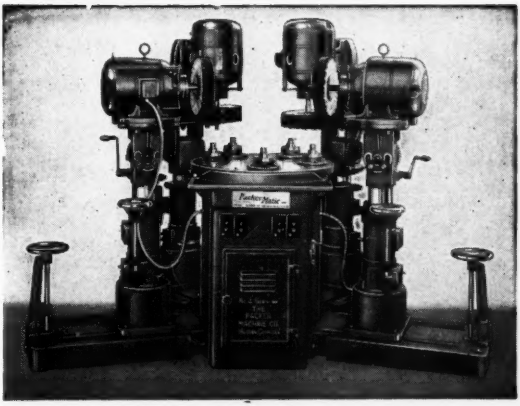
VOLUME FINISHING AT A SAVING » » »

EXAMPLE

PARTS of varied shapes and sizes, in all types of industries are being efficiently and economically Finished on Packer-Matic — the modern method of Automatic Polishing and Buffing.

ROTARY, STRAIGHT LINE CONVEYOR AND ROLL types (Rotary shown at right) are proving their value, daily, in factories where volume Finishing at a Saving in hour costs is imperative.

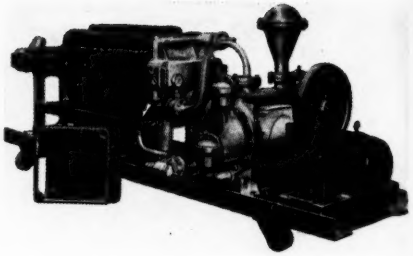
Send your Part for a "Time Study," Gratis. WRITE "Time Study" Dept.



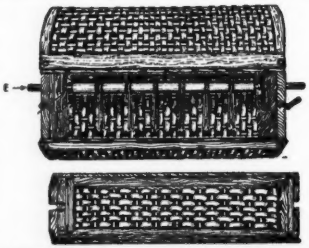
THE PACKER MACHINE CO. MERIDEN, CONN., U.S.A.

able. The filter plates are of the Shriver open section, criss cross grid design, which permits rapid drainage of clear liquid and rate of discharge. The plates and frames are of rubber covered cast iron. All piping is also rubber covered.

The Shriver diaphragm pump, which is particularly adapted for handling corrosive solutions, has rubber covered valve chambers, expansion chambers, heads and manifolds. The unit shown in the illustration is an 18 chamber, 18 in. square, two eye filter with a 30 g.p.m. pump. The filtering capacity ranges from 1,500 to 2,500 gallons per hour depending upon the nature of the fluid handled and percentage and character of the solids to be removed, and the quantity of filter aid that may be required.



Shriver Plating Solution Filter



KING

PLATING BARRELS

PRODUCE
CLEANER, FASTER, SMOOTHER PLATING
A wood woven cylinder adaptable to any barrel plating tank.
Initial cost less than one-half.
There is no maintenance cost.
Stocked in sizes to fit your present tank.
Write for illustrated folder.

Use them once—you'll use them always

JOHN KING
48 SPRINGFIELD ST., DAYTON, OHIO

Sol-Klean

A liquid metal cleaner for steel, aluminum, terne plate, galvanized steel, and so on, to be known as "Sol-Klean," has been placed on the market by Industrial Chemical Products Co., 3777 Bellevue Ave., Detroit, Michigan.

Sol-Klean is said to contain phosphoric acid, compatible solvents, and other ingredients necessary to produce efficient and effective cleaning. This material is said to impart rust-inhibiting properties.

Sol-Klean can be used to remove oil, grease, dirt, rust, oxide, films, and insure a firm bond between base metal and finishing material.

Solvents Recovery

A solvent recovery service has been made available through Solvents Recovery Service, Inc., Lister Ave., Newark, N. J. The process employed was

FOR A PERFECT FINISH-
USE HARSHAW ANODES
AND CHEMICALS.....

THE HARSHAW CHEMICAL COMPANY

CLEVELAND, OHIO
and Principal Cities

perfected by Mr. Lewis Lofgren, and is known as the Lofgren Process.

The Lofgren Process involves an analysis of each customer's contaminated thinners to determine the proper treatment. Distillations are made and sometimes intermediate treatments are included which do not affect the original composition of the thinner. The system is said to be flexible enough so that as little as 200 gallons of contaminated solvent, as well as a car load, can be treated economically.

Contaminated solvents treated by means of the Lofgren Process are returned to the customer clear water white, free from acids and other foreign matter.

Miccrolac

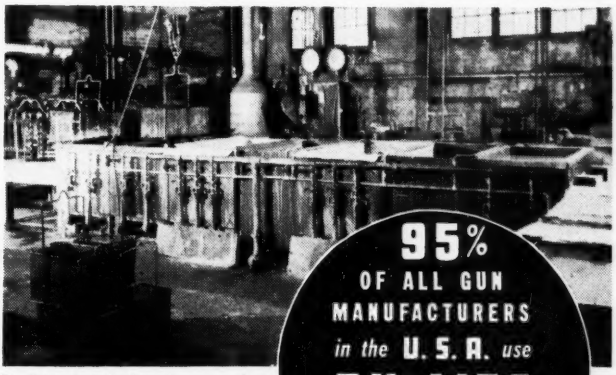
A new coating material, known as Miccrolac, to be used to protect and beautify metal surfaces of either natural or plated finishes, has been introduced by the Michigan Chrome Company, 6340 East Jefferson Avenue Detroit.

One of the outstanding characteristics of this new material is its color, which approximates that of distilled water. In addition, it dries to a high lustre, and offers excellent qualities of adhesion, flexibility and abrasion resistance. It dries exceptionally fast—the type of coat applied for ordinary decorative work drying in only a few seconds' time.

Miccrolac provides excellent resistance to sulphur dioxide, sunlight, moisture (preventing rust), oil, grease, gasoline, and all commonly known chemical fumes. It does not blush even in the most humid weather.

A unique feature of this material is that it is not to be mixed with thinner as has been the usual practice with similar lacquers. It is used exactly as it comes out of the container. It is accurately adjusted for viscosity and total solids to insure absolutely uniform results. This eliminates all possible chance of contamination during the mixing operation, and does away with the guesswork and extra labor usually involved in adding thinner to the lacquer.

Miccrolac is furnished in one-gallon



Du-Lite installation in one of America's leading gun factories.

REDUCE
Finishing Time
By At Least 3 Hours

Du-Lite, the sensational new low-temperature black bath, cuts gun finishing costs by..... **66%**

- 1 tank turns out twice as much
- 5 to 15 minutes is enough
- low temperature does not affect heat treated parts
- cuts gun barrel coloring costs from 10c or 12c to 2c
- really foolproof in daily use.

If you apply black finish to steel, Du-Lite will save you real cash! Send us some samples for processing. We'll do them without charge, and send you descriptive literature telling all about Du-Lite.

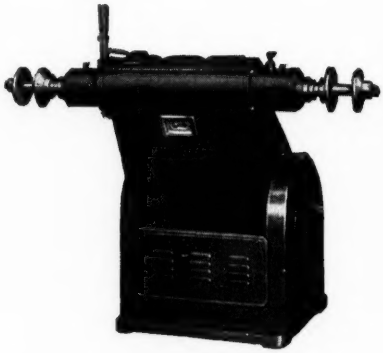
DU-LITE CHEMICAL CORPORATION
MIDDLETOWN • CONNECTICUT

and five-gallon cans and fifty-gallon drums. It is applied by spraying or dipping. If desired, it can be brushed on small parts. Among its many applications are: silver plated ornaments, trophies, and so on, polished brass or brass plated light fixtures, interior and exterior hardware and similar products, automobile hardware, copper, aluminum, wrought iron or stainless steel surfaces. It is an excellent material for protecting the finish on exposed metal surfaces of scientific instruments. It can be used on all types of metal mouldings.

Hammond Overhanging Spindle Polishing Lathe

An addition to the Rite-Speed polishing and buffing lathe line to be known as the model 10-ROH has been placed on the market by Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich. This polishing lathe has an overhanging spindle of 12½ in. from the lower front of base. According to the manufacturer, this lathe is especially desirable on large, bulky pieces.

Standard equipment with the Hammond Overhanging Spindle Lathe includes a spindle lock for holding spindle when changing wheels, a combination switch and brake which shuts off motor and instantly stops the revolving spindle, and an automatic motor starter. Motors up to 10 h.p. with multi-V belt drive mounted inside the base are also furnished.



Hammond Overhanging Spindle Polishing Lathe

M & W Perspiration Resisting Lacquer

A new type of clear lacquer that is especially suitable for finishing articles frequently handled, such as flashlamps, pencils, compacts, lipsticks, and so on, has been announced by Maas & Waldstein Company, makers of industrial finishes, 438 Riverside Ave., Newark, N. J.

This new lacquer has been specially

NOW...

S-310

RUST INHIBITIVE

Formulated specifically for the following properties:

1. Very fast air-drying
2. Water-whiteness
3. Tenacious adhesion
4. Hardness combined with flexibility

and

RUST RESISTANCE

S-310

is used and recommended as a clear coating for hand tools, machine tools, hardware and wherever a clear protective coat for bright metal is required.

The Varnish Products Co.
5208 Harvard Ave. Cleveland, Ohio

For a real good polishing job use

KEYSTONE EMERY

TURKISH — NAXOS — AMERICAN

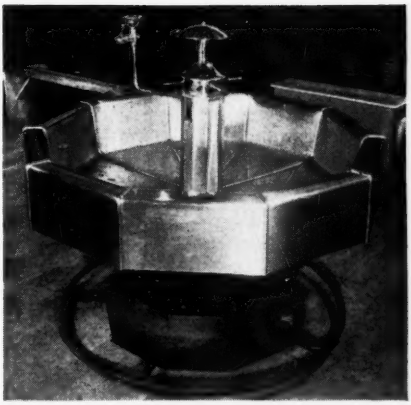
KEYSTONE EMERY MILLS *Write for Sample* **4316 Paul St., Phila, Pa.**

developed to resist the corrosive action of perspiration, and furnishes excellent protection for both finished metal surfaces and undercoats of lacquer enamel. It is light in color and has good outside weather resistance, adhesion, and color retention. It is furnished in either high gloss or flat finish.

Memco Groupwash Fixture

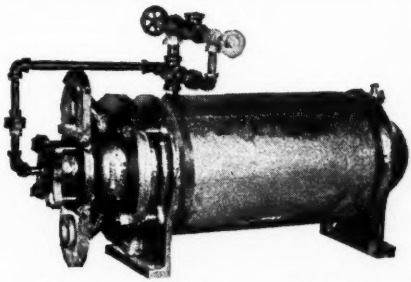
There are no washroom traffic problems during clean-up time in plants where "Memco" groupwash fixtures are used. The equipment is manufactured by the Metalloid Engineering & Manufacturing Company, 4015 Cherry St., Cincinnati, Ohio, and provides many new and exclusive features.

Made of Armco stainless steel by a patented fabricating process, the Memco always looks new and sanitary. The bowl is assembled in sections from 26-gage satin finish stainless steel. The joints are leak-proof, having stainless steel beads and moulded rubber gaskets. This way, individual sections can easily and economically be replaced in case of damage. The sturdy base is made from 12-gage steel with a crackled baked enamel finish. There are two removable panels in this base for plumbing connections. In all models, including the wall-type groupwash, the fixtures are designed to fit all plumbing connections.



Memco Groupwash Fixture

External heating of cleaning and plating solutions with Duriron Heaters



Low pH plating solutions, and the advantages of heating both plating and cleaning solutions, make external heaters, as illustrated, highly desirable.

No solution contamination . . . more uniform results . . . fewer rejections . . . reduced plating time . . . increased production capacity — are some of the advantages obtained by the use of Duriron Heat Exchangers.

Write for Bulletin No. 1601 for detailed information—no obligation, of course.

THE DURIRON COMPANY, Inc.

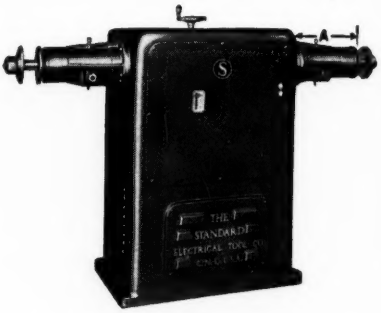
431 N. FINDLAY ST. • DAYTON, OHIO

The largest Memco groupwash fixture accommodates 10 persons and requires only 16 sq. ft. of floor space. This is said to be less than half the space needed by other fixtures for the same number of persons. The "Monitor" sprayhead is an exclusive feature, mixing hot and cold water to any temperature at constant pressure. It provides a shut-off with one control. The bowl is 29 in. high and is virtually self-cleaning, since the spray action constantly rinses the "pitched" sides while the groupwash is in use.

Standard Variable Speed Buffing and Polishing Machine

The Standard Electrical Tool Company, 1941 W. Eighth Street, Cincinnati, Ohio, has recently developed an infinitely variable speed buffing and polishing machine designed to serve any kind and all requirements of buffing, polishing, coloring, and so on. According to the manufacturer, the correct speed for each operation can always be obtained, using any size or type wheel. In addition, longer wheel life and more efficient production are said to be insured, with an additional saving being reflected in that worn wheels no longer have to be discarded.

The change in speed is accomplished



Standard Variable Speed Buffing and Polishing Machine

quickly and easily by merely turning a handwheel conveniently located at the top of the machine. Each change of spindle speed is shown in revolutions per minute on the indicating dial at the front, and while the full speed range is 1,000 to 3,500 r.p.m., the speed changer can be set for any intermediate speed range desired.

All of the equipment, including the speed changer, constant speed 1,800 r.p.m. ball bearing motor and magnetic starter, is enclosed inside a substantial base, while the push-button station is located at the front of the machine. Removable louvered covers at the sides and front and a large removable cover at the top front provide easy access to inside of base.

THE ADIRONDACKS GORE MOUNTAIN CRYSTAL GARNET ORE

ABRASIVE GARNET

World's Standard for Over 60 Years
FOR
Abrasive Paper and Cloth
Grinding Wheels
Sand Blast
Lithographing
Non-Skid Surfaces
Wearing Surfaces
Ornamental Purposes
Minus 300 Mesh For Polishing

BARTON MINES CORPORATION
NORTH CREEK, WARREN COUNTY, N.Y.

RUST-I-CIDE "50"
Cleans, etches, and prepares metal for a perfect finishing job.
It can help your product.
RUSTICIDE PRODUCTS CO.
3125 Perkins Ave. • Cleveland, Ohio

Features of construction include a high grade nickel-steel spindle with hard bronze spindle nuts, four heavy duty ball bearings, and liberal oil reservoirs, with visible oil supply. A shaft lock is also provided for use when changing wheels.

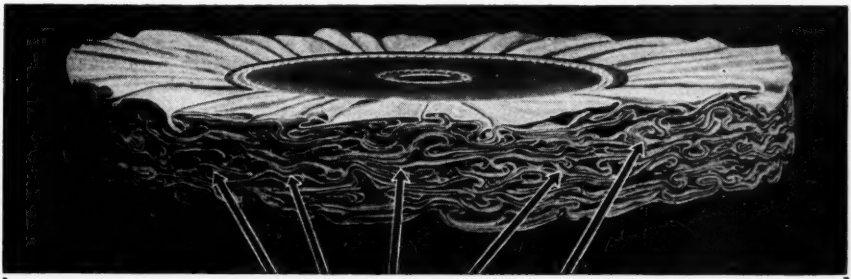
Available in 3, 5 and 7½ h.p. sizes, with larger sizes furnished to order, the Standard Infinitely Variable Speed Buffing and Polishing Machine, it is said, incorporates simple construction and easy operation, with quiet and smooth performance. The straight front pedestal permits the wheels to extend beyond the machine proper, allowing ample freedom of operation and foot room.

Paasche Cub Airbrush

An airbrush with a new easy-grip, black tenite handle, to be known as the Cub type, has been placed on the market by Paasche Airbush Company, 1909 Diversey Parkway, Chicago, Ill. A new calibrated control of spray, and a larger, more easily removed and easy to clean aircap are said to be features that eliminate defective spray patterns, orange peel, streaks, runs and sags, air and fluid leaks, and excessive mist.

A short fluid passage on the Cub type Paasche Airbrush increases coating speed and prevents clogging. This type of airbrush atomizes all finishing materials at high speed and under control and provides a wide, wet spray. It may be used with a pressure tank or overhead bucket, gravity or syphon cup. Another feature is the adjustability both for air pressure and air consumption.

Paasche Cub Airbrush



All work: No waste: Low cost

That is the Standard for all BIAS Buffs. Arrows point to extra overlap ply—more polishing face by 50 per cent. Saves compound. Bias cut and formed cloth insures against raveling and waste. Costs less than ordinary buffs—length of wear and service considered.

We make buffs for every buffing purpose.

The BIAS BUFF *and* WHEEL CO., Inc.
430 Communipaw Ave.
Jersey City, N. J.

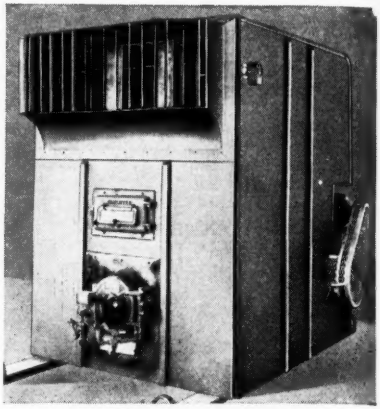
We make BIAS Ventilated Buffs. Try them.

Directherm Unit Heaters

Directherm Unit Heaters, manufactured by the Airtherm Mfg. Company, St. Louis, Mo., are now available with oil burning units completely assembled in the full capacity range of these units. Directherm oil-fired Unit Heaters are available in six standard sizes with capacities ranging from 300,000 to 1,500,000 Btu's.

The oil burning unit has been especially developed to meet the particular requirements of direct firing wherein the heat of combustion is immediately converted to actual heating purposes with minimum loss. The Directherm heater can be set up for full automatic control both as to room temperature and as to delivery temperatures of the warm air at the unit. It is a self-contained heating system with high efficiency of combustion chamber, comparatively low outlet temperatures and a horizontal high velocity air stream with an adjustable wide angle of delivery. The multi-blade centrifugal fan distributes the warm air directly from the unit, throughout the area to be heated, thus eliminating any additional cost for duct work to provide uniform heating. Duct work, however, can be used where required.

There are many applications wherein the Directherm unit is the ideal solution—airplane hangers, aviation manufacturing plants, garages, warehouses of all kinds—isolated buildings to which it is impractical to pipe steam and for partial heating of various types of buildings where the cost of operation of a central steam plant would be prohibitive.



Directherm Unit Heater

The Directherm Unit Heater is also available for gas or coal firing (stoker or hand).

Browne Emergency Lamp

A light for locations, where there is no electric current available or where it is hazardous to introduce long power

GALVAPREP

FOR ZINC and ZINC-COATED METALS

Galvaprep cleans and provides a hard paint receptive surface; removes and neutralizes harmful agents and provides an ideal toothed base for paint. Economical and simple to use.

Write for Galvaprep folder.

NEILSON CHEMICAL CO.

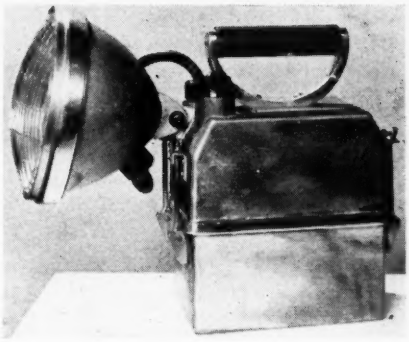
5564 Benson St. Detroit, Mich.

1852 E. Slauson St. Los Angeles, Calif.

extension cords, is introduced by the Stewart R. Browne Manufacturing Co., Inc., 2589 Broadway, New York, N. Y. The unit is identified as the Model SB 100. In case of power failure, operating independently of all power circuits, this storage battery emergency lamp can be used for light until normal service is restored. It can be used safely when it is dangerous to use any other kind of light, at times when: Repairing leaks in gas mains; working on pipe lines; entering tanks or vessels containing inflammable liquids.

All of the joints between the two parts of the battery case, the lamp and the lens holder, the case and the cord of this storage battery emergency lamp are sealed; and together with a vapor-proof switch, insure positive protection against ignition of explosive gases or vapors.

A special laminated and shatter-proof lens, strong enough to resist even a severe blow, protects the light bulb. A second refractor lens, which more uniformly diffuses the beam, is mounted in the same holder with the shatter-proof lens and adds to its lighting efficiency. Spillage of acid is avoided by a unique design of battery plates which involves the principle of capillary attraction.



Browne Emergency Lamp

Every precaution and effort have been taken to make this storage battery emergency lamp safe and serviceable in case of power failure; pipe line repair, tunnel lighting, tank cleaning, gas main repair, entering tanks or vessels containing inflammable liquids and construction work where there is no electric service.

FOR HIGH-SPEED PRODUCTION

LIVELY ACTION METSO!

IN BARREL CLEANING, soaker tank or electric cleaning, use Metso Cleaner to hold rejects at a low point. Metso has able-bodied alkalinity balanced with silica that lifts the grease and leaves metal chemically clean.

One large plater because of Metso's faster, complete cleaning action eliminated 5 different operations in the cleaning sequence.

Let Metso help to step up your cleaning operations. Stocks are conveniently available in over 65 cities.

PHILADELPHIA QUARTZ CO.

Gen'l Offices: Ionic & 3rd Sts., Philadelphia
Chicago Sales Office: 205 W. Wacker Drive

METSO CLEANERS

K. A. T. for Water Treatment

An emulsion of organic materials utilizing colloidal principles of absorption, absorption and electro-physical polarization to be known as "K.A.T." has been placed on the market by the American K. A. T. Corporation, 122 E. 42nd St., New York, N. Y. This material is said to contain no synthetic chemicals or oils and its action is strictly physical. Scale forming impurities are coated and precipitated as an easily removable sludge.

K. A. T. can be used to remove and prevent scale formations in water stills and evaporators. The material will work with all waters and requires no chemical water analyses except of hardness determination. According to the manufacturer, K. A. T. will prevent entrainment and promotes pure distillate.

Brightboy Discs and Polishing Wheels

Discs and polishing wheels for removing small blemishes on finished steel, to be known as "Brightboy," have been placed on the market by Weldon Roberts Rubber Company, 351 Sixth Ave., Newark, N. J. Heat marks from welds on stainless steel can be quickly erased with Brightboy, leaving a bright clean surface.

Wherever small burrs, stains, or rust appear on metal work, Brightboy Discs and Polishing Wheels can be used. The secret of the effective action of these wheels is said to lie in the soft rubber

Brightboy Polishing Disc

binder which cushions the abrasive, thus giving a bright lustre finish without spoilage if the work should slip during the operation.

M & W Hammertone Finishes

Finishes resembling hammered silver, copper, bronze, and other ornamental metals can be applied to products made of any kind of metal and also bakelite molded plastics by the use of a new type of finish, known as "Hammertone," which was recently developed by Maas & Waldstein Company, 438 Riverside Ave., Newark, New Jersey.

Okey Let's Settle this AT OUR EXPENSE!

Will using a pre-finished metal cut your production costs? Here is an opportunity to find out . . . at our expense. We supply you — without cost or obligation — with enough metal to conduct a conclusive cost comparison test in your own plant, on your own product, according to your own system of accounting. Write for complete information on this offer. This test may be the most important step in your company's history.

AMERICAN NICKELOID COMPANY
Manufacturers of Pre-Finished Metals
SHEETS COILS FLAT WIRE
1320 Second Street --- Peru, Illinois

GRINDING & BUFFING WHEELS
For Extraordinary SERVICE and ECONOMY

ATLANTIC WEKA CORP.
35 Wooster St.
New York, N. Y.

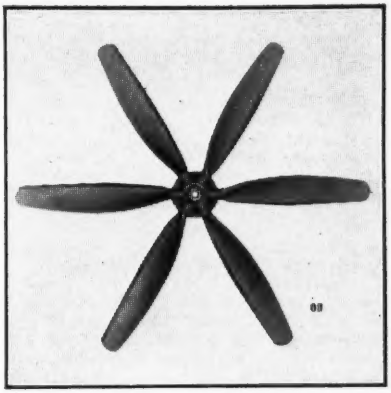
MANUFACTURERS OF
AWEKA
SPECIALTIES

In finishing a surface with Hammertone, a base coat of the desired color is first sprayed on. This is followed immediately by a spatter coat of Hammertone liquid, which produces the hammered pattern in the base coat. The product is then baked at medium heat for an hour, which produces a lustrous metallic finish that is very tough and durable. By using a special form of spray gun perfected by Maas & Waldstein, for the spatter coat, even an inexperienced sprayer can produce any desired hammered pattern and maintain it uniformly.

Hammertone, according to the manufacturer, is an excellent finish for metal novelties, heating units, air conditioning equipment, metal cabinets and furniture, bakelite radio cases, and many other products. The speed and ease with which it can be applied adapt Hammertone for continuous production methods.

Hartzell Charavay Fan

The Hartzell Propeller Fan Company, 1963 Shroyer Rd., Piqua, Ohio, has placed an industrial fan on the market



Hartzell Charavay Fan

to be known as the "Charavay." The design of the fan includes the tear-drop, standard, and birdwig propeller. Each of the propellers is said to meet a definite industrial or commercial need.

The Hartzell Charavay fan is available in single-propeller, two-propeller,

Make Metal Cleaning a Production Process with a Ransohoff Machine

Metal Cleaning is *not* a nuisance when you have a Ransohoff Machine. It is a modern production process, with all of the advantages of speed, labor saving and better product.

The Standard Conveyor Type machine illustrated at right does everything automatically except load itself. It does a better cleaning job at lower cost than old fashioned methods, and will soon pay for itself.

Write for information about low cost standard unit machines, or about a special design for your individual problem, and how to make metal cleaning of any kind a production process in your plant.

N. RANSOHOFF, INC. 208 W. 71st STREET CINCINNATI, OHIO

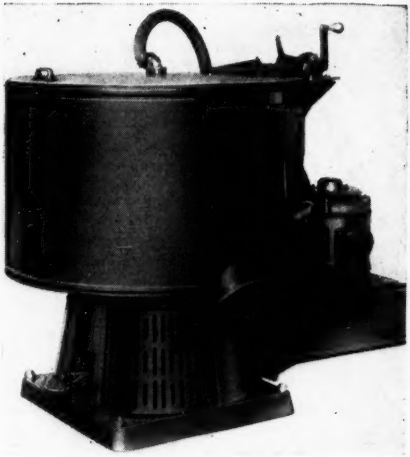
and multiblade types. The mounting style includes an improved extension shaft, a new belt-drive blower, a belt-drive exhaust fan, and a slow tip speed fan.

The Hartzell tear-drop propeller is said to provide economy in power consumption. The new fan is said to meet present needs and at the same time provide for future increase or decrease in air needs.

Tolhurst Centriforce Washer

A centrifugal machine which washes, rinses and dries small metal parts, to be known as the Centriforce Washer, has been placed on the market by Tolhurst Centrifugal Division, American Machine and Metals, Inc., East Moline, Ill. This unit is designed for use in finishing departments and plating plants.

As a detergent washer, the Centriforce washes screw machine parts with hot detergent solution to remove oil, grease, dirt or fine chips. As a rinser, the work is spun in the centrifugal while a spray of hot water swirls through the parts. As a drier, the machine is revolved at high speeds while blasts of hot air are forced through and around the parts.



Tolhurst Centriforce Washer

According to the manufacturer, up to 25 batches an hour of work can be handled in the Centriforce Washer.

Jackson Sweatbands

Two ruggedly constructed sweatbands, made of fine pore, cellulose sponge securely stitched to a fabricoid band with an inner lining of cork, have been announced by the Jackson Electrode Holder Company, 15118 Mack Ave., Detroit, Michigan.

No. 15, photographed in position, is a general purpose band, a safety device for eliminating the hazard of perspiration running into the eyes. It is easily

Borolon
TRADE MARK

POLISHING GRAIN

First quality aluminum oxide abrasive grain manufactured in our own electric furnace plant under strictest standards of quality and uniformity. Available in four types (CT, T, B, TB), each of which is most efficient for polishing work within its field of application. Write for Abrasive Grain Data Sheet No. 1 giving complete details. Samples sent of grain sizes you specify.

ABRASIVE COMPANY
Division of Simonds Saw and Steel Company
Tacony & Fraley Streets · Philadelphia, Pa.
Chicago Branch: 1624 South Western Ave.

Would you like to reduce your painting costs?

Let SOL-KLEAN do it!

Write for complete information.

Industrial Chemical Products Co.
3777 Bellevue Ave. - - - - - Detroit
743 N. Fourth St. - - - Milwaukee
5454 Higgins Ave. - - - - - Chicago

adjusted to the head with a long-lasting, ½-in. wide, elastic band.

No. 5, as illustrated, is intended for

Jackson Sweatband No. 5

use with all Jackson eyeshields, except types D, D-6, and No. 25. It is easily snapped inside the bands.

Both bands are said to be light, cool, comfortable, and easily absorb more

Jackson Sweatband No. 15

than 15 times their weight in moisture. The bands can be quickly cleaned by letting water or any safe, antiseptic solution run through the sponge cellulose.

Milburn Type FF Twin Stage Regulator

A twin stage air regulator to be known as the Type FF has been placed on the market by Alexander Milburn Company, 1493 W. Baltimore St., Baltimore, Md. This unit is said to be another member of the well known Milburn Ball Seat group, and represents the latest developments in two-stage performance.

The first stage of the Type FF can be adjusted to various pressures, thus permitting it to be used for different operations. After the selected pressure is set,

BEFORE
You Paint Metal
USE
DEOXIDINE

DEOXIDINE prepares metal surfaces perfectly for painting. Removes oil, rust, and rust stimulators. Etches slightly, and holds the paint. Available through paint distributors, or direct from us. Bulletin on request.

AMERICAN CHEMICAL PAINT CO.
Dept. 303 • Ambler, Pa.

"DOUBLE HEADING"
with I F Turkish Emery and I F Naxos Emery

These HAMILTON products are used by W. R. Case & Sons Cutlery Company of Bradford, Pa., to glaze both sides of knives at the same time. TRY: "Indian Brand" Turkish and Naxos Emery or "Hecco Brand" American Emery. Write for your trial lot — today.

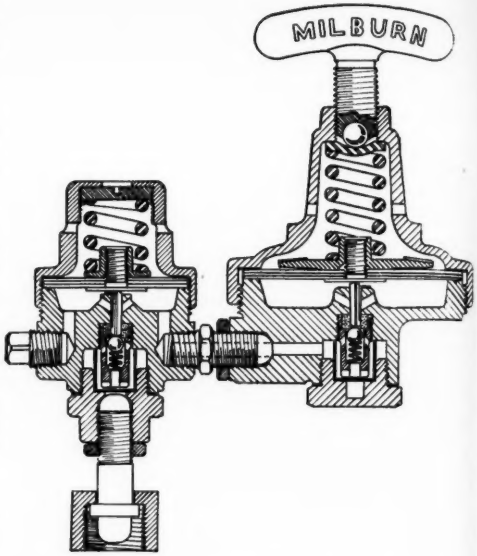
(Photo Courtesy W. R. Case & Sons Cutlery Co.)

HAMILTON Emery & Corundum Co.
CHESTER • MASS.

the delivery stage may be adjusted to any desired working pressure up to 200 lbs., or more, if specified. It operates smoothly, and permits a uniform delivery.

The outstanding feature of the Type FF's simplified construction is a unitary valve assembly, which is used in both stages. This assembly has only four parts — a small body, stainless steel spring, stainless steel ball, and special vulcanite seat — operated by a Monel metal pin. Seating is with instead of against the pressure. Each stage has a loose, replaceable diaphragm, and removable and interchangeable inlets, adaptable to any tank or line connection for any type of gas. Noncorrosive cylindrical filter screens enclose seat units, thus insuring protection from dirt and foreign particles. The bodies and adjusting keys are of forged bronze.

Particularly interesting is the fact that the first stage of the Type FF can be purchased separately, and attached to practically any make of single stage regulator, converting it to two-stage control. Only simple adjustments are necessary.



Milburn Type FF Twin Stage Regulator

Unmatched Speed
New Features
Lower Prices

New opportunities for shortcuts and savings in finishing operations are yours with one of the new AIRFLOS. Write today for illustrated catalog.
CROWN SPRAY GUN MFG. CO.
1218 Venice Blvd., LOS ANGELES, CAL.

TEN NEW Airflo PORTABLE PAINTING OUTFITS
Warehouses in Principal Cities

Acheson Coating for Immersion Heaters

"Furring" of electrical immersion heaters may now be prevented or minimized as the result of the development of new coating on which a patent has been granted to Acheson Colloids Corporation, Port Huron, Michigan.

The treatment is exceedingly simple, consisting merely of dipping, spraying or brushing the parts in or with a coating that hardens on exposure to light. The coating itself consists of a water suspension of colloidal graphite, a hardenable organic colloid and a hardening agent.

The coating is said to improve heat conductivity, and to possess a relatively high degree of resistance to abrasion.

Flextite

An active ingredient has been developed for Flextite which is said to bring

the activity of this material down to a measure of seconds instead of minutes. The new Flextite can be used with ordinary portland cement and forced against water pressure and held there only a few seconds in order to stop a leak.

Flextite is said to be invaluable in

Making an actual repair against water pressure using Flextite

stopping leaks in concrete tanks, reservoirs, and so on. It can be used for waterproofing and dampproofing pits, tanks, and other similar places.

Flextite to which the new ingredient has been added is marketed by Flexrock Company, 23rd and Manning Sts., Philadelphia, Pennsylvania.

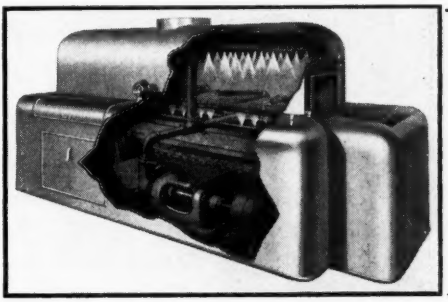
Oakite Oxbrite Process

Having been successfully used under actual production requirements in a number of plants and clearly evidenced its outstanding advantages and economies, an improved method for the electro-cleaning of buffed brass, bronze and other copper alloys has just been announced by Oakite Products, Inc., New York, N. Y. Data on it is now being released to the trade through its nationwide organization of Service Represen-

"MAGIC" TACK RAGS
IMPROVE YOUR FINISH 100%

MAGIC TACK RAGS remove specks, lint and sand particles--- bring out that deep, smooth luster, produce a faultless surface for white or colored finish. Why use "home made" tack rags when you can buy MAGIC TACK RAGS at trifling cost! They are tackier, do not dry--- are dust-proof and spontaneous combustion proof. Packed in dozen and gross lots or more. Made only by the

Wm. A. Juergens Co.
4036-40 Lagrange Street,
Toledo, Ohio, U. S. A.
If your dealer does not carry Magic Tack Rags, write us for sample.



HYDRO-FLOW
Industrial Washing Machines

Streamlined design. Hidden motors, pumps and pipes are easily assembled. Piping and nozzles located to insure thorough cleansing of all surfaces. Rugged and efficient pressure pump. Corrosion resistant spray nozzles — from mist to open stream. Monorail, Belt or Gravity type conveyors designed to carry any shape or size material. Variable speeds on conveyor drive synchronize production.

Write for circular.

International Conveyor & Washer Corp.
640 E. FORT ST. DETROIT, MICH.

tatives. The method should be of interest to executives in charge of plating departments where either bright nickel, chrome, cadmium or other plating finishes are applied to brass, bronze and other copper alloys.

The Oakite method is said to eliminate the necessity of a cyanide dip and a copper strike before bright nickel plating. The new method, to be known as the "Oakite Oxbrite Process," makes possible the bright nickel plating of soft soldered work without preliminary copper plating.

Another outstanding and important feature claimed for the method is the assurance of freedom from peeling of electro-plated deposits caused by inadequate preparation of the surfaces. Because it effectively removes all soap films and metallic deposits and also prevents surface embrittlement, the method provides much finer adhesion, so that bright, lustrous, uniform electro-plated deposits are obtained.

Depending upon the relative amount of buffing compound present and the shape or other physical characteristics of the particular work to be cleaned, two alternate procedures for applying the process are available.

Bias Type A Buffs

The Bias Buff & Wheel Company, 430 Communipaw Ave., Jersey City, N. J., announces a type of buff that has been specially designed to reduce high polishing costs in the buffing and finishing departments. Increased polishing surface, and the elimination of waste in both cloth and polishing compounds, together with the exceptionally good constructive features are points that the company emphasizes.

This buff is known as the Type "A" and is well adapted for all classes of work. Cloth from which Bias Buffs are made is produced in the company's own mills, and it is claimed that this cloth is unequalled for durability and long wearing qualities.

The Bias Buff & Wheel Company makes a line of guaranteed ventilated buffs for use where high speeds are necessary in certain kinds of buffing and finishing.

CHECK IN AT DE WITT OPERATED HOTELS

In Cleveland
HOTEL HOLLENDEN

In Columbus
THE NEIL HOUSE

In Akron
THE MAYFLOWER

In Jamestown, N. Y.
THE SAMUELS
and
THE JAMESTOWN

In Corning, N. Y.
BARON STEUBEN
HOTEL

DeWITT OPERATED HOTELS

Theo. De Witt, Pres.

R. F. Marsh, Vice Pres. and Gen.-Mgr.

HOTEL
BARLUM
Now One of the
ALBERT PICK HOTELS
21 FLOORS OF OUTSIDE ROOMS
EACH WITH COMBINATION TUB & SHOWER
FROM $2 DAILY SINGLE
CADILLAC SQUARE AT BATES ST.
DETROIT

Opportunity Section

BARGAIN

IN PLATING GENERATORS

1500/750 amp. 6/12 volt, 1100 rpm, Z.L.&L.
1000/500 amp. 6/12 volt, 1150 rpm, H.&V.W.
750/375 amp. 6/12 volt H. & V. W.
400/200 amp. 6/12 volt H. & V. W.
300 amp. 3 volt Elec. Prod. vertical motor drive.
200 amp. 7½ volt Hobart, motor drive.
200 amp. 6 volt Electric Products, motor drive.
150 amp. 6 volt Connecticut.
150/75 amp. 7½-15 volt Eager, motor drive.
50 amp. 6 volt Leland, single phase motor drive.
Plating generators Bought, Sold, Exchanged. *Write*

THE MOTOR REPAIR & MFG. CO.
1535 Hamilton Ave. Cleveland, Ohio

FOR SALE

Two (2) Model VS-800 Detrex Degreasers. Size VS-800 3'x5' complete with 1/4 HP 220-Volt 60-Cycle 3-Phase motor and controls. Purchased new 1939 — excellent condition.

THE DURHAM MANUFACTURING CO.
MUNCIE INDIANA

EQUIPMENT FOR SALE

1—Blakeslee—Degreaser. Type—No. 3-L.V. Size of Cabinet 35" wide x 46" long x 56" high. Equipped for Gas or Steam—Practically New—Heavy Gage Steel Constructed—An Unusual Buy—Cost $650.00—Will Sell $250.00—F.O.B. Cincinnati, Ohio.

CINCINNATI PLATING & REPAIR CO.
116 W. Central Pkwy. Cincinnati, Ohio

Used Plating Equipment for Sale

Steel and wood tanks, lined and plain; many kinds, sizes of buffs, wheels, brushes; polishing lathe, blower, motor, rheostats, line switch, saw dust tumbler, plating barrel, analytic set, immersion heater, plating barrel, generator, etc.

METAL PROTECTION PLATING CO.
1328 Locust St., Kansas City, Mo.

THIS Opportunity Section is available for classified advertisements featuring equipment, employment, business opportunities, etc., in the industries devoted to the cleaning, plating, polishing and finishing of metals. For advertising rates and other information address:

PRODUCTS FINISHING
431 Main Street • Cincinnati, Ohio

Lighting for Seeing on the Job. A 24-page catalog describing Fostoria Localties is now being issued by The Fostoria Pressed Steel Corporation, Fostoria, O. This catalog is divided into sections describing lamps in single arm models, double arm models and special models.

Fluorescent and silver bowl canopy model Localites for industrial and commercial purposes are illustrated and described. Plant superintendents and maintenance men will find this catalog of unusual interest.

Copy free upon request.

Mention PRODUCTS FINISHING when writing to advertisers. Your cooperation will be appreciated both by the advertiser and this magazine.

FOR YOUR *Catalog* LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Industrial Ovens

An illustrated industrial oven book featuring safety, speed, economy, and efficiency in industrial drying and finishing processes is now being issued by The Kirk & Blum Mfg. Co., 2816 Spring Grove Ave., Cincinnati, Ohio.

2. Seamless Rubber Processing

A four-page catalog describing and illustrating seamless rubber processing for all industries and for many types of products is now being issued by Automotive Rubber Inc., 8601 Epworth Blvd., Detroit, Michigan.

3. Griptite Metal Cement

Literature is now being distributed describing a rubber cement which is now being marketed by St. Louis Rubber Cement Co., 3948 West Pine, St. Louis, Missouri.

4. Ruggedware

Information regarding the manner in which Chrysotile makes tougher featheredges and body on ruggedware is contained in a catalog now being issued by Flexrock Company, 23rd and Manning St., Philadelphia, Pennsylvania.

5. Grinding Wheel Data Book

A 112-page catalog containing complete descriptive information about the manufacture, use and application of grinding wheels is now being issued by Abrasive Company, Tacony and Fraley St., Philadelphia, Pennsylvania.

6 Rust Prevention for Iron and Steel

A description of Parkerizing, what it does, and how it is applied is contained in a book entitled "Parkerizing" now being issued by Parker Rust Proof Company, 2172 E. Milwaukee Ave., Detroit, Michigan.

7. Pyramid Instruments

A four-page bulletin illustrating and describing Pyramid pyrometers and thermocouple fixtures is now being issued by Tamms Silica Co., 228 N. La Salle St., Chicago, Illinois.

8. Foxboro Instruments

A folder in which quotations of the demonstrated benefits of modern instrumentation are included is now being issued by The Foxboro Company, Foxboro, Massachusetts.

9. Chemical Resisting Equipment

Chemical resisting equipment for electroplating and metal pickling process is described in a folder which is now being issued by Heil and Company, 3088 W. 106th St., Cleveland, Ohio.

10. Baker Guide to Successful Plating with Gold

A 12-page catalog describing gold plating methods and processes and including formulas is now being issued by Baker & Co., Inc., 113 Astor St., Newark, New Jersey.

11. Hellige pH Instruments

A catalog designated as the "No. 602," describing and illustrating Hellige pH apparatus, is now being issued by Hellige, Inc., 3718 Northern Blvd., Long Island City, New York.

12. Easy Electric Sander

The all-electric portable finishing machine for easy finishing application known as the "Easy" Electric Sander is described in a catalog now being issued by Detroit Surfacing Machine Company, 7433 W. Davison Ave., Detroit, Michigan.

13. Analysis of Plating Solutions

The fifth edition of this booklet describing simple methods of analyzing plating solutions is now being issued by Hanson-Van Winkle - Munning Co., Matawan, New Jersey.

14. Airway Ventilated Buffs

Cool cutting buffs for high speed buffing operations are illustrated and described in a 4-page folder now being distributed by Jackson Buff Corporation, 21-03 41st Ave., Long Island City, New York.

15. Weka Grinding and Polishing Wheels

A six-page folder describing and illustrating Weka grinding and polishing wheels is now being issued by Atlantic Weka Corp., 35 Wooster St., New York City.

16. Paper Masking Tape

A masking tape that is highly resistant to lacquers, paints, and solvents is described in this folder now being issued by Industrial Tape Corporation, New Brunswick, New Jersey.

17. Dust Control

A complete story of dust control in words and pictures by means of Roto-Clone dust control equipment is now being issued by American Air Filter Company, Inc., 702 Central Ave., Louisville, Ky.

18. Metal Cleaning Tips

The chemical classification and selection of alkaline metal cleaners is contained in a bulletin which has been prepared and is now being distributed by the Cowles Detergent Company, 10525 Carnegie Ave., Cleveland, Ohio.

19. Pentrate As a Permanent Product Finish

An attractive four-page catalog describing the Pentrate process of metal-finishing is now being issued by Heatbath Corporation, 242 Westfield Ave., Springfield, Massachusetts.

Print plainly in filling out coupon for literature.

PRODUCTS FINISHING
431 Main St., Cincinnati, Ohio

I am interested in receiving the following literature reviewed in your September issue.

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Roxaprene is ideal for use in infra red radiant drying equipment.

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ROXALIN *Flexible* FINISHES

A FINISH TO MEET EVERY PRODUCTION REQUIREMENT

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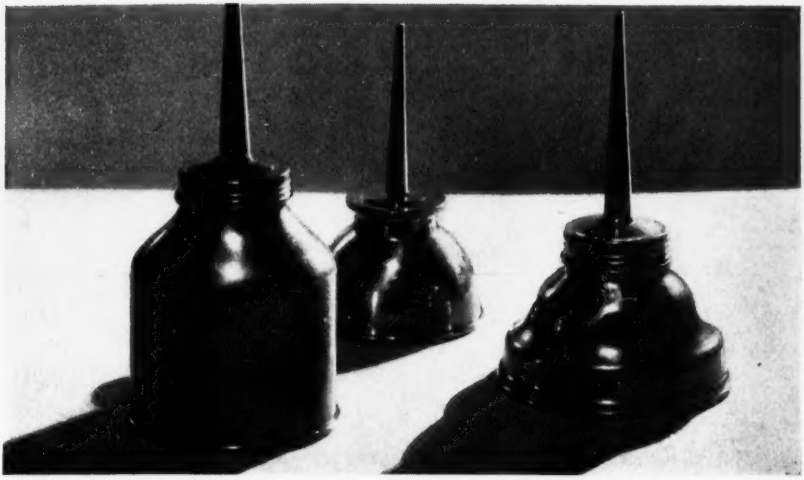
Now, SQUIRT OILERS HAVE BETTER FINISH thanks to dependable OAKITE cleaning



To the engineer responsible for industrial equipment maintenance, or to the man who tinkers in his home workshop after office hours, a squirt oiler is a highly convenient and useful gadget.

Lubrication problems today are greatly facilitated by the many different types available. In addition, a durable, attractive finish adds to the usage and appearance value of these handy "oil cans." Accordingly, their makers are keenly attentive to cleaning and finishing operations.

Because they consistently produce the clean surfaces required, keep rejects at a negligible point, speed production and lower costs . . . Oakite materials are employed by leading manufacturers of automobile, machine and squirt oilers for cleaning before copper plating, nickel plating, bronze painting and other finishing operations.

IT PAYS TO CHANGE OVER TO OAKITE

Whatever product you make you will find that dependable Oakite materials help you keep cleaning on a trouble-free, low-cost basis. It is why more plants are changing over to Oakite every day. Tell us your problem . . . no obligation.

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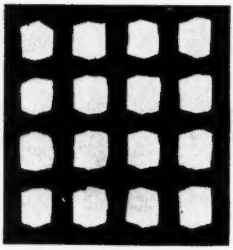
OAKITE MATERIALS & METHODS *Certified* **CLEANING** FOR EVERY CLEANING REQUIREMENT



These "Eyes" say:

NO GIANTS or MIDGETS WANTED!

● These eyes are typical of the magnified apertures of carefully selected and tested screens regularly used by The Carborundum Company, for screening Aloxite Brand Aluminum Oxide "TP" Grain. These screens remove the giant oversized grains that may scratch the work and the midget undersized grains that have no polishing value. They insure a uniform size of maximum efficiency for the polishing wheel. They mean for instance that one shipment of #36 made in September is just as perfect as another made in May. They permit standardization of practice in the polishing shop. The inspection of these screens by the laboratories of The Carborundum Company before they are put into use makes certain that they are evenly woven, that there are no cross-eyed apertures, nor near-sighted and far-sighted meshes to distort the sieving of this important product.

This is another reason for the constant and consistent superiority of Aloxite "TP" Grain . . . another reason for specifying Aloxite Brand Aluminum Oxide "TP" Grain the next time you order.

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REG. U. S. PAT. OFF.
ABRASIVE PRODUCTS

THE CARBORUNDUM COMPANY

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Sales Offices and Warehouses in New York, Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh, Cincinnati, Grand Rapids

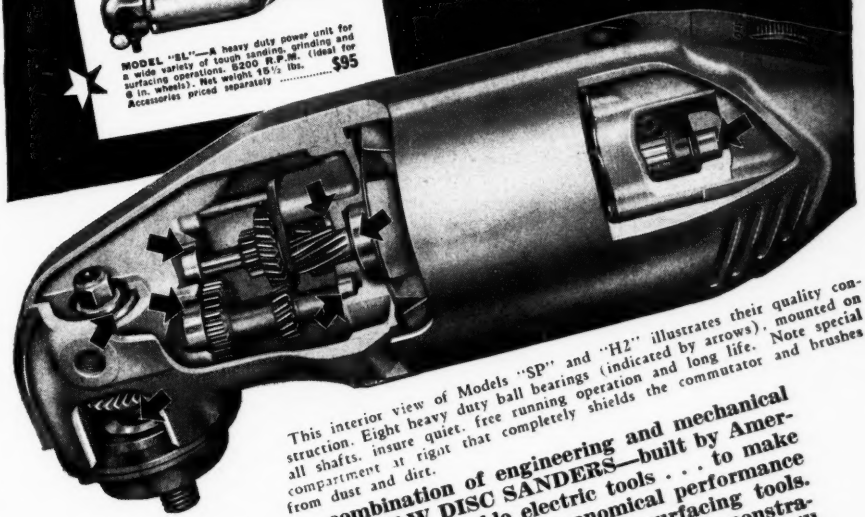
(Carborundum and Aloxite are registered trade-marks of and indicate manufacture by The Carborundum Company)

THESE 3 NEW SKILSAW DISC SANDERS reach a new high in quality construction!

MODEL "SP"—A two-speed sander-polisher for efficient sanding, rubbing and polishing. Sanding speed 4200 R.P.M.; polishing-buffing speed 1300 R.P.M. Net weight 14¾ lbs. $67

MODEL "H2"—This powerful sander drives a 9 in. pad at 2700 R.P.M. and then, after the worn disc is trimmed to 7 inches, drives the 7 in. pad at 4200 R.P.M. Net weight 10 lbs. $78

MODEL "SL"—A heavy duty power unit for a wide variety of tough sanding, grinding and surfacing operations. 5200 R.P.M. (Ideal for 9 in. wheels). Net weight 15½ lbs. Accessories priced separately $95



This interior view of Models "SP" and "H2" illustrates their quality construction. Eight heavy duty ball bearings (indicated by arrows), mounted on all shafts, insure quiet, free running operation and long life. Note special compartment at right that completely shields the commutator and brushes from dust and dirt.

Never before such a combination of engineering and mechanical refinements as in these New SKILSAW DISC SANDERS—built by America's leading manufacturer of quality portable electric tools . . . to make possible longer tool life and faster, better, more economical performance for all users of universal electric sanding, buffing and surfacing tools. Ask your distributor for a demonstration on your own work . . . and you'll agree that these finer tools will prove to be an investment that will bring dividends in lower costs and more efficient production.

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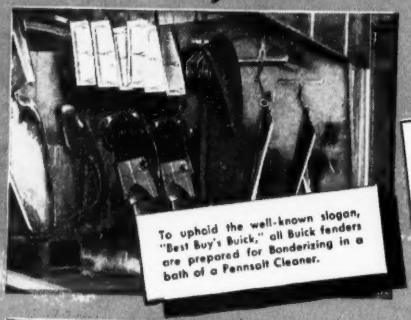
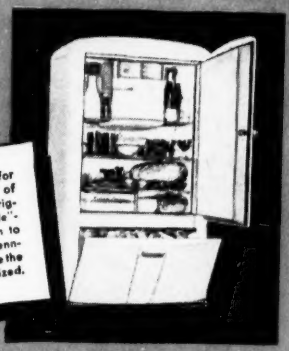
KELVINATOR REFRIGERATORS

...all are prepared

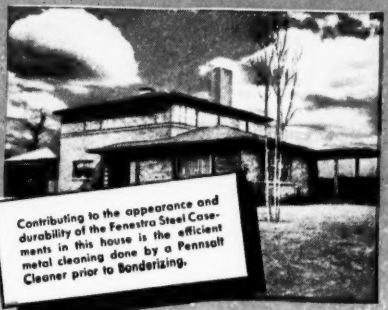


To uphold the well-known slogan, "Best Buy's Buick," all Buick fenders are prepared for Bonderizing in a bath of a Pennsalt Cleaner.



Helping to account for the beautiful finish of this Kelvinator refrigerator is the "sparkle"-free surface given to the metal by a Pennsalt Cleaner before the unit was Bonderized.

Here is an Acme Thriftee Kitchen for the moderate-priced home. Cabinets of finest furniture steel are washed under hard-pressure spray with a Pennsalt Cleaner, then Bonderized.



Contributing to the appearance and durability of the Fenestra Steel Casements in this house is the efficient metal cleaning done by a Pennsalt Cleaner prior to Bonderizing.

for Bonderizing by PENNSALT Cleaners

THESE four famous products, all conspicuous in use, must have both beauty and durability of finish. The cleaning operation, before Bonderizing, must provide the *smooth*, satin surface upon which the final finish can be built. It is no coincidence that these four famous products put the all-important metal-preparing job up to Pennsalt Cleaners.

Their solvent and emulsifying action, lasting power and fast cleaning ability are well known in many industries, which report not only a cleaning job superbly done but at great savings of money. Starting with Orthosil as our original heavy-duty cleaner, we have developed a whole family of cleaners that meet, with laboratory precision, just about every industrial need.

One or another of our Pennsalt Cleaners is likely to fit into your processes with efficiency and economy. Would you care to make a test? Our technical staff is ready to give full information and assistance. Write to Pennsalt Cleaner Division, Pennsylvania Salt Manufacturing Company, Philadelphia, Pa. Address Dept. F.

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Impervious to atmospheric conditions

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EGYPTIAN FINISHING LACQUERS are extremely durable and may be either air-dried or baked.

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●

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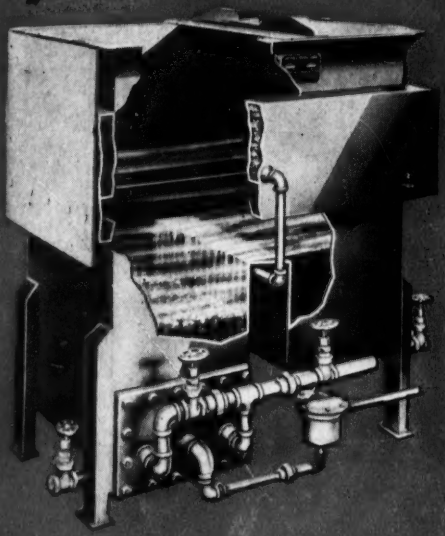

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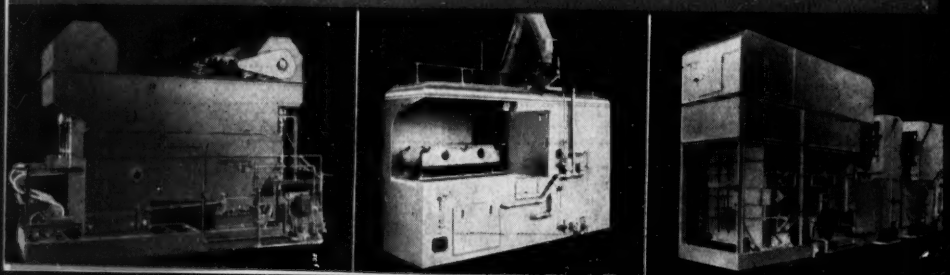
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